

AMERICAN FORESTS



MARCH 1944

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THERE ARE STILL UNDISCOVERED CONTINENTS

COLUMBUS had a definite goal—a westbound sea route to Asia. But what he found was a new continent—a new source of Nature's wealth.

Modern research also has its goals: it, too, is discovering new resources. Starting from the knowns of science, it charts its voyages into the unknown. Behind each voyage is a theory that there is a passageway.

But research doesn't hold stubbornly to its theories. If it finds islands instead of a continent, it accepts them, for it expects the

unexpected. It studies their relation to the known lands of science. And on the basis of its increased knowledge, it makes revised plans for progress. In science there is always a continent ahead.

Just what research will disclose can never be forecast. But history has proved that from research flow discoveries of value to mankind. From Bell Telephone Laboratories there has poured a full stream of improvements in the telephone art.

Bell Telephone Laboratories has kept America leading the world in

telephony. And its researches have contributed importantly to other arts of communication—to the phonograph and sound-motion pictures, to radio broadcasting and television.

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When peace comes, its organized teams of research scientists and engineers will continue to explore and invent and perfect for the improvement of telephony.



BELL TELEPHONE SYSTEM

AMERICAN FORESTS

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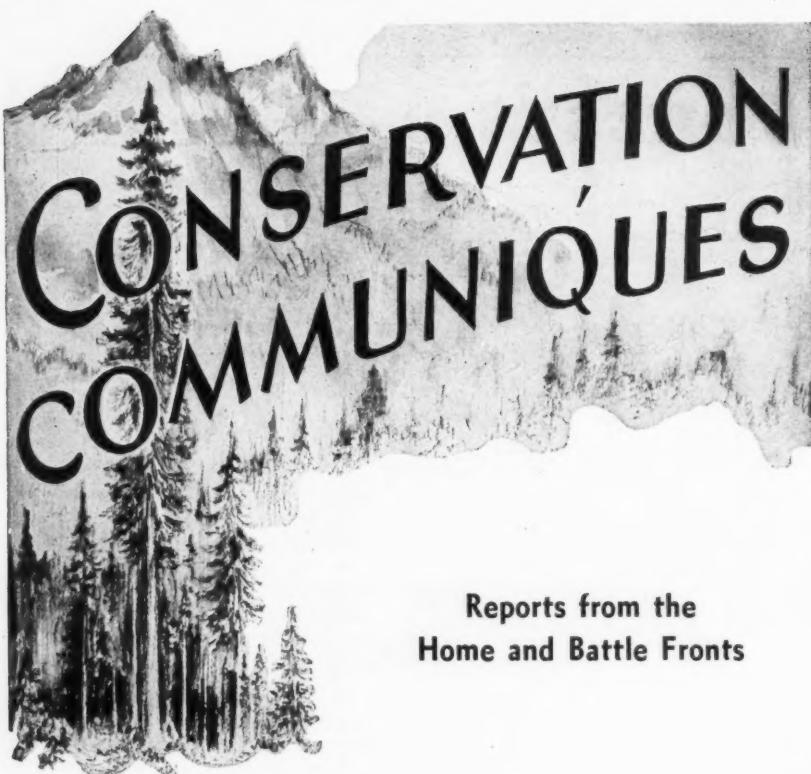
The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—*AMERICAN FORESTS*—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

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CONSERVATION COMMUNIQUES

Reports from the Home and Battle Fronts

Employment of war prisoners on logging and lumber operations has been approved by the War Department to ease a critical manpower situation. Heretofore, use of prisoners in the forest industries has been confined to cutting pulpwood.

The rubber situation is looking up. Collection of wild rubber from additional forest areas in Kenya is now under way, reports the South African press. In Mexico, two new milling plants designed to boost substantially crude-rubber production from guayule for export to the United States are nearing completion. And in China, scientists of the National University of Kwangsi are reported to have discovered that rubber latex is present in two plants which grow extensively in that country. The Chinese government is providing a subsidy of \$50,000 for further experiments.

Trees to honor Dunkirk. To commemorate all who took part in the evacuation of Dunkirk, a "Forest of Thankfulness" will be planted near the Kent Coast in England. Reports from London indicate that hardwoods "of the kinds used to build big and little ships" will be grown.

War lumber requirements for 1944 have been set by the WPB at 34,000,000,000 board feet. This is less than the 1943 consumption figure of 37,000,000,000 feet and the peak 1942 figure of 42,000,000,000 feet. This year around 15,000,000,000 board feet, almost one-half of all production, will be needed for crating and packaging materials for shipment to the war fronts; 6,000,000,000 feet will be used for military construction purposes; railroads, utilities and heavy industries will get better than 6,000,000,000 feet; and 7,000,000,000 feet will go for defense housing and other essential requirements.

If Axis reports are correct, plans have been made to reconstruct Estonia's largest paper mills, destroyed during the early days of the war. The mills, however, will be rebuilt to only fifteen percent of their former capacity.

On this side of the Atlantic, Brazil is planning a huge paper and cellulose company, claimed to be the largest single private enterprise to be launched in that country, to tap the almost limitless source of paper pulp offered by Brazil's vast forests. With a capitalization of \$15,

000,000, the new company will be known as the *Companhia Nacional de Papel e Celulose*. Brazil's infant paper industry of between thirty and forty mills, produced 250,000 tons of paper in 1941.

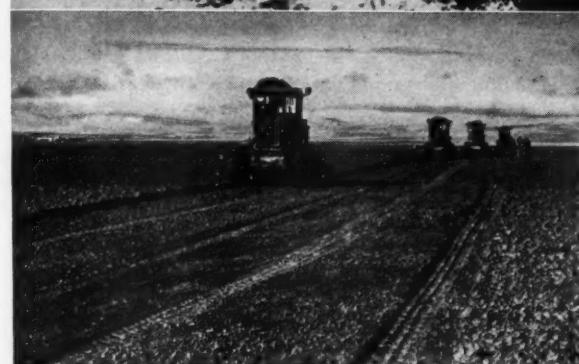
The Nazis now have a school for fishermen. In need of trained replacements, the German high sea fishery has established the "Young Fishermen's School" in Wesermunde. Fifty youths have been enrolled for the course under the leadership of an experienced master of a fishing vessel. Later, a special training ship will be placed in service.

While forests in private ownership are supplying the great bulk of war lumber requirements, the cut on public forest lands is increasing. For example, during the last half of 1943, timber cut on the national forests reached an all-time high—nearly 2,000,000,000 board feet. This is half a billion feet more than was cut in the same period of 1942. National forests of the Pacific Northwest provided 750,000,000 feet; California forests 250,000,000 feet; and southern national forests 165,000,000 feet.

London agricultural experts report an estimated decline of livestock in the occupied countries of Europe to 11,000,000 cattle and an equal number of sheep. Compare this with the 33,000,000 cattle and 40,000,000 sheep now producing meat and wool for victory on the grazing lands of our own western states!

Mrs. Roosevelt wants fishing tackle and Senator Bailey, of North Carolina, wants a fishing survey. The First Lady has made a plea for heavy fishing tackle, rooks and files for the men stationed on South Pacific islands. Fishing, she said, is their chief amusement and main source of food. Contributions should be made to the Red Cross. Senator Bailey was thinking of fishing right here at home when he asked Congress to finance a survey of marine and fresh water fishing, looking toward a national policy beneficial to both the sportsman and commercial fisherman. According to the Senator, who asked \$20,000 for the job, there has been no complete report on United States and territorial fisheries since around 1880.

"TOUGHEST MOTOR GRADER ON EARTH!"



• A fleet of "Caterpillar" Diesel Motor Graders at work on a big landing field for Allied planes in the North African war zone.

• In New Guinea, this "Caterpillar" Diesel Tractor with sheep's-foot roller and "Caterpillar" Diesel Motor Grader build a new air strip.

• Heavy rains and flooded roads during the pursuit of Rommel in Libya could not stop these "Caterpillar" Diesel Motor Graders, needed for leveling airfields.

THAT'S the way contractors and county officials have always talked about their "Caterpillar" Diesel Motor Graders. That's the way men in the armed forces talk about them today. For these rugged machines have proved themselves as versatile and dependable in war as they ever did on construction and maintenance jobs at home.

"Caterpillar" is building them now at the greatest production rate in history. But motor graders are so vitally needed by fighting men that only a few machines can be allocated by the War Production Board to purchasers in war-essential work.

If it comes to a choice between repairing your local roads or rushing through an emergency landing field for hard-pressed Yank airmen, there can be no argument. We've got to win the war.

However, there's a brighter side. This same huge "Caterpillar" production will be available for civilian needs as soon as war and government regulations permit. There'll be no time out for retooling. The machines you get will be war-tested—up to the minute in every detail. They'll have the same unfailing power and traction, the same ease of handling, the same wide range of blade positions that have always made "Caterpillar" Diesel Motor Graders first choice.

In the meantime, many who need "Caterpillar" Diesel Motor Graders must wait for peace. Do your best to keep your present equipment going. Enlist the "Fighting Four" for the duration. And if you reach the point where you must have a new machine, talk to your "Caterpillar" dealer. He will gladly explain how you can apply for it.

CATERPILLAR TRACTOR CO., PEORIA, ILL.

CATERPILLAR
REG. U. S. PAT. OFF.

TO WIN THE WAR: WORK—FIGHT—BUY U. S. WAR BONDS!

WHEN THE BOYS COME HOME . . .

THE men who do the fighting on distant battlefields will come home some day. But to what?

We who are entrenched along the home front hold the answer to this. If we are content merely to buy War Bonds, work longer hours and endure without complaint the restraints total war brings to everyday living, no one can say what is ahead after victory has been achieved. But if we include in our home front objectives sound concepts and intelligent planning in dealing with our natural resources, the future of our fighting men may be safely charted.

They will want, first of all, security—a chance to live their lives and raise their families free from the shadow of unemployment and doles. This means permanent industries and sustained payrolls. They will want a healthy environment—good water and stimulating recreation. They will want schools and churches, libraries and civic clubs—all of the social and economic opportunities a democracy should afford every community from Main Street to Broadway.

Our forests are the backbone of American industry. They provide wood in many forms for many uses; they gather and store water so that our great network of dams may keep

producing needed hydro-electric power. Permanent, well managed forests mean permanent, community-supporting industries.

"If forests bring health to men's bodies, they also bring beauty to their spirits," wrote the late Glenn Frank. The forests are America's greatest recreational asset, the greatest builders of healthy environments.

Since its inception in 1875, The American Forestry Association has worked unceasingly for the development of the highest service the forests can give to the economic and social stability of the nation. Largely due to these efforts our forests, despite unprecedented demands upon them, can be made to contribute to postwar rebuilding just as effectively as they are today contributing to our fight for freedom. We on the home front must undertake as a wartime objective the shaping of sound conservation policies and practices for our postwar forests. We must be on guard so that the men who do the fighting on distant battlefields will come home to a nation secure in its future. This is a challenge!

THE AMERICAN FORESTRY ASSOCIATION

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Forest Resource Appraisal

JOHN B. WOODS, Director

JOHN C. REDINGTON, Field Secretary

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WHAT GOVERNORS OF THE STATES THINK OF THE FOREST RESOURCE APPRAISAL OF THE AMERICAN FORESTRY ASSOCIATION!

"The forest resources of this country are vitally important and I am glad to see that studies are being undertaken now with a view to outlining plans for postwar reconstruction. The problem is a serious one and must be handled intelligently, and I am sure that the assistance tendered by the Association will be greatly appreciated."—SAM C. FORD, *Governor of Montana*.

"The plan your Association has undertaken should be of great help to us and to other forested states where serious thought is given to postwar readjustments."—EARL SNELL, *Governor of Oregon*.

"The background of the study correctly enumerates sound precepts as they refer to the reestablishment of the forest resources of this State. I am particularly impressed with your summary of the statements referring to the building of a peace, the four corners of which must rest on raw materials, private enterprise, full employment and sound public policies."—SPESSARD L. HOLLAND, *Governor of Florida*.

"The project outlined is one of great interest to all of the states and indeed to all citizens who are mindful of the tremendous importance of forest protection and conservation. * * * We are therefore keenly alert to any well-designed movement for the protection of these great natural resources."—J. MELVILLE BROUGHTON, *Governor of North Carolina*.

"The value of the forest resources of the nation was never more evident than today and it is most encouraging to know that your Association has taken an active part in safeguarding these resources."—LEVERETT SALTONSTALL, *Governor of the Commonwealth of Massachusetts*.

"I am glad to endorse the program proposed by The American Forestry Association for the study of forest conditions as affected by the war. I can assure you of the wholehearted cooperation of any New Jersey state agency that may be of help in carrying on the study."—CHARLES EDISON, *Governor of New Jersey*.

"I wish to express my wholehearted approval of the work that you propose to do concerning the economic problems that will be affected by the wartime pressure on our forest and agricultural lands."—DWIGHT H. GREEN, *Governor of Illinois*.

"I think such a study is most essential and should be pleased to cooperate in any effort along this line."—ARTHUR B. LANGLIE, *Governor of Washington*.

"I am in accord with your views that forest lands will have an important bearing on the postwar economy, and I appreciate your thoughtfulness in making available for my consideration the outline of your plan."—SUMNER SEWALL, *Governor of Maine*.

This important undertaking is a joint responsibility of all conservation interests—public and private alike. It is the most important conservation job that needs doing today.

Additional underwriting is necessary. The goal is \$250,000—two-thirds of which has now been promised. We invite your help in completing the financing. Do it now with a cash contribution, a pledge, or, as a number have done, buy a Series F or G War Bond in the name of The American Forestry Association and mail it to us.

THE AMERICAN FORESTRY ASSOCIATION, 919 17th Street, N. W., Washington 6, D. C.



WILD GEESE

By HOLLIE LEE MASON

LAST NIGHT I was awakened by the talk of wild geese overhead. The rising and falling cadence of their "honk, honk, — honk, honk," affected me as primitive drums are said to affect savages. Sitting bolt upright in bed with ears strained I listened with awe to this flock of geese winging its unerring way back north to its ancient nesting grounds, guided by knowledge surer far than any gained in the schools of man. To hear wild geese talk while the flock soars far above in wedgeshaped formation behind some wise old gander, is to experience one of Nature's grandest thrills.

Eagerly I await the coming of the wild geese in spring and fall. But it is the northward flight in early springtime that affects one as would release from a long term spent in prison. It is a renewed assurance that all is well; that the leaves will return, the flowers bloom and the birds sing; that our common mother, Nature, still nurtures her wild children; and that spring's soft, gentle warmth will release the icy grip of winter throughout the land.

There is a spirit of freedom about the gabble of wild geese overhead that grips the soul and inspires a fervent desire to be one with them, wild and untamable. Last night as I listened to the bold, free talk of the wild geese I forgot that I was earthbound, a slave to man's thousand and one petty but liberty-destroying conventions, and in fancy took flight with the geese over endless miles of fields and woodlands, cities and towns, villages and plains, lakes and rivers, valleys and mountains, and great forests of tall conifers through which clear, bold mountain streams hurried down toward the sea.

Then at last, weary but with thankful heart, I settled to earth with the flock where they will mate, lay their eggs and bring off their fluffy, yellow goslings in happy, busy days to come in a cool, crisp, pleasant land where, back to a time that baffles the imagination, geese like these have lived and mated and brought forth their young.

The howling of the neighbor's dog broke my reverie. He, too, had been profoundly stirred by the passage of the wild geese overhead, for there is that something in the call of wild geese that awakens the savage in us. Thoreau, stirred by it, remarked that a flock of wild geese never winged its way overhead without to some extent unsettling the price of real estate.

Wild geese have ever been a part of my life. The full, busy years of boyhood, spent down there in the teeming forests of the bayou country, were enriched in fall, winter and into spring by wild geese. My first recollection is of a scene in which wild geese played an important role. It was a sun-bright day in winter, such as only the bayou country knows. The sunlight glistened on the leaves of the green bay trees and sparkled from the sandy road that wound its lazy way past our home. I stood with my mother in the doorway and surveyed the delightful scene. A big, square-shouldered man with a heavy black beard stood in the yard, a double-barreled shotgun held loosely in the crook of his arm. In front of him, spread out on the porch, were a number of big, wild geese. My mother was smiling, and a broad grin broke through the heavy black beard. It was then that memory awoke in me. And that memory will remain—strong and beautiful,—as long as life is mine, for the man grinning through the heavy, black beard was my father.

Editorial

UNCLE SAM—LANDLORD

SENATOR BYRD'S Committee on the reduction of nonessential federal expenditures reveals Uncle Sam as the nation's largest landlord. His holdings last year totaled 383,600,000 acres, or about twenty percent of continental United States. Nearly 15,000,000 acres have been acquired since 1940, mostly for war uses.

This landed estate varies from village postoffice sites to national forests embracing millions of acres. Some sixty agencies administer these lands, but the Departments of Agriculture and Interior control ninety-five percent of the total for conservation purposes. The 155,000,000 acres of national forests form the largest segment; the Grazing Service has jurisdiction over 139,000,000 acres; and unallotted public domain, national parks, Indian lands and wildlife reservations make up most of the remainder.

The committee has assembled a valuable mass of public land data, but some of its conclusions and recommendations indicate lack of deep study. For example, it is stated that Uncle Sam has too much land and early liquidation of surplus wartime holdings is advocated. If by "surplus" is meant lands which have no value for peacetime public use, their disposal as soon as is advantageous should have universal support. On the other hand, a policy of wholesale liquidation would be undesirable. Lands originally set aside for conservation purposes which are now being used for war purposes should be returned to those uses when hostilities end. Lands purchased specifically for the present war emergency which are better adapted to peacetime conservation than to private ownership should be assigned to whatever form of conservation use they are suited. Careful, competent study should precede action on the auction block.

The report also brings out that there is growing opposition to further federal acquisitions on the ground that it removes land from local and state tax rolls. While literally true, the assumption that all federal land is tax free is not entirely correct. No state or community can send Secretary Morgenthau a tax bill for fed-

eral land within its borders and expect to have it paid, but on many categories of federal lands the government makes payments to states and communities that approximate taxes.

Unfortunately, these so-called "lieu payments" are made without consistent policy. They apply, for example, to national forests but not to national parks, and even here payment, based on a percentage of the gross income from the individual forests, is not always equitable. This basis results in payments perhaps larger than necessary for communities located near forests where timber or grazing receipts are high. On the other hand, forests in which there is little timber cutting or grazing pay almost nothing to support local public services.

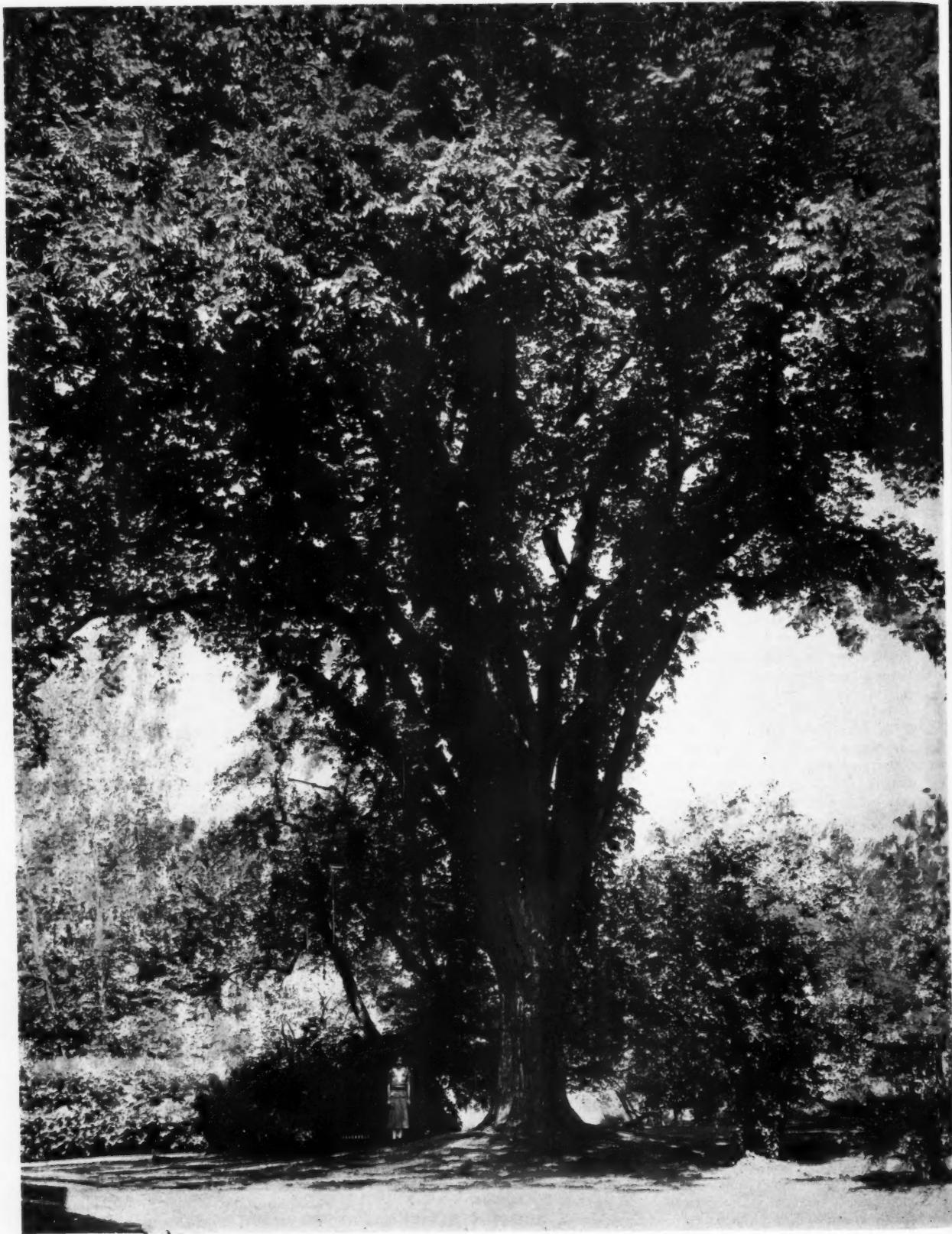
The Federal Real Estate Board, a committee representing all federal land holdings, has recommended action to correct these illogical situations. Congress undoubtedly will give the matter consideration when and as war demands permit. As a matter of fact, the subject already has been given much study and several bills are now pending in Congress designed to provide more equitable payments to states in lieu of taxes lost by federal acquisition of large land areas.

Aside from the matter of tax revenues, the Byrd Committee, by inference, seems not to favor further conservation land purchases despite the fact that for years Congress has had a policy of acquiring land, chiefly national forests, for conservation management and use. This policy has received strong public support and has been applied only in states whose legislatures approved federal acquisition of forest lands within their boundaries. Originally, the purchases were confined to the headwaters of streams where soil erosion and water conservation problems were of interstate and national importance. Later, the federal policy was extended to include the acquirement of lands for timber production, and here policy recently has run into increasing opposition in a number of states.

According to Lyle F. Watts, chief of the Forest Service, there are upwards of

150,000,000 acres of forest land now in private ownership which the Service believes should be brought under public management. These include private holdings within and adjacent to existing national forests and other areas chiefly valuable for soil and watershed protection—areas whose timber growing possibilities are not great enough to warrant timber growing and management by private endeavor. While there will probably always be argument over the amount of forest land the federal government should eventually own in rounding out an adequate program of national forest conservation, it has long been accepted that there are still millions of acres that will never receive proper management unless that management is provided by the federal government or the states. That is a phase of public welfare inherent in land ownership which the Byrd Committee cannot evade.

Finally, the Byrd Committee recommends that consideration be given to centralizing "operational functions of appraising, acquiring, abstracting and disposing" of all federal real estate in a single federal agency. A bill, S. 1463, that would carry out this proposal, probably in a larger way than the committee had in mind, is now pending in the Senate, introduced by Senator Hatch at the request of the Comptroller General of the United States. It is so broadly drawn that if enacted by Congress it might be interpreted to invest the General Land Office with power not only over all federal lands but over improvements and resources attached to them. After giving consideration to the measure, the Board of Directors of The American Forestry Association went on record against it on the grounds that it would confuse and disrupt the handling of conservation work on federal lands. While it is improbable that the bill in its present form will receive favorable consideration by Congress, its introduction is indicative of the fact that this important and complicated problem of federal land ownership and management is not being given the studied consideration that public interests demand.



The American Elm,— tall, majestic, sheltering

REBUILDING THE AMERICAN ELM

Efforts to Eradicate the Deadly Dutch Elm Disease Having Failed, Plant Scientists Turn Their Wizardry Toward Developing a Disease-Resistant Tree

By SILAS J. SMUCKER

SINCE the discovery of the Dutch elm disease in this country in 1930, herculean efforts have been made by federal and state agencies and the general public to eradicate this foreign invader from our shores. Unfortunately, these efforts have been unsuccessful, mainly because of the nature of the disease, and other means of combating the menace must be considered. Among the most important of these are the possibilities of finding an American elm possessing natural resistance to the disease or of developing new, resistant elms by planned hybridization.

This is the task of the plant pathologist and plant breeder who must visualize this new product of their skill and science as retaining all of the virtues but none of the vices of each of the parent trees from which it has sprung. It is a difficult assignment, but not an impossible one, as has been demonstrated many times with other plants that are being bred to resist diseases caused by fungi, bacteria and viruses, as well as such unfavorable environmental conditions as excessive heat, cold and drought.

Examples of notable achievements made in the production of disease-resistant plants are the wilt-resistant tomato, which saved the Florida producers from ruin, strains of cantaloupes resistant to powdery mildew, and cabbages resistant to yellows. In comparison with the progress made with other agricultural crops, that of forest tree breeding is relatively a virgin field.

The basic principles of hybridizing trees to secure disease resistance are fundamentally the same as for other plants. Obviously, there are difficulties not involved in hybridizing small, quick-maturing plants, and tree breeding requires a much longer time for the successful production of improved strains than similar work with annual plants. The tree breeder must often develop new techniques to overcome the special problems he meets.

Natural hybrid trees have been re-

ported from time to time, and the percentage of some of these undoubtedly has been accurately determined. Some of the hybrids grow more vigorously than either of their parents. One of the first early workers to produce artificial tree hybrids was Klotzsch, who in 1845 hy-

bridized two species each of pine, oak, elm and alder, and noted that the resulting hybrids possessed growth characteristics superior to their respective parents.

Attempts to hybridize forest trees in the United States were more or less sporadic until Van Fleet initiated the



Siberian-American elm hybrid—resistant to Dutch elm disease

chestnut breeding work in 1909, while chestnut blight was raging through our native chestnut stands. In 1924, the Oxford Paper Company, in cooperation with the New York Botanical Garden, started a comprehensive project in hybridizing a number of species of the genus *Populus* in order to produce new poplars valuable for pulpwood reforestation. A year later, the Eddy Tree Breeding Station (now the Institute of Forest Genetics) at Placerville, California, initiated a project for the intensive study of various problems in forest genetics.



Removing the pollen-bearing sacs from elm flowers is a tedious job for the hybridizer. Above, flower cluster of American elm, three times natural size—at right, single flower showing feathery stigmas surrounded by pollen sacs, twelve times natural size



In recent years numerous federal, state and private agencies, through breeding and selection, have undertaken the development of improved timber trees, chiefly of pine, spruce, Douglasfir, walnut, oak and black locust. A few agencies are attempting to combine disease resistance with improved timber qualities, and some are seeking to combine desirable timber qualities with high productivity and high quality annual crops of fruit, such as nuts, berries and acorns, for food for man, stock, or game in connection with reforestation and prevention of soil erosion.

The American elm, native to portions

of all states east of the Great Plains, but now growing successfully in most every section of the country, is well known to millions of Americans. Although valued primarily as a shade and ornamental tree, its tough wood is used extensively for shipbuilding, furniture, flooring, boxes and many other essential products. In the present world conflict, elms have proved particularly desirable for the protective concealment of fortifications, factories and cities.

Tall, majestic and sheltering, its beauty and utility, since the days of the early settlers, have made it one of the country's most prized trees. But now it is threatened by two destructive diseases. In the Northeastern States the Dutch elm disease, caused by the fungus *Ceratostomella ulmi* Buis., is the principal threat to its survival. In the central and lower Ohio River watershed, the elm is being attacked by *Phloem necrosis*, a fatal virus disease.

If this threat, particularly from the Dutch elm disease, can-

be checked, and so far efforts in this direction have not proved successful, we must rebuild the American elm. A desirable tree would be one that is resistant to diseases, one that has the ability to withstand extremes of cold in winter, heat in summer, and alternations between heat and cold at all seasons; adaptability to the supply of nutritive salts and moisture in the soil and to soil acidity would be necessary, as would resistance to pest attacks. Other desirable characteristics would be resistance to storm damage, which is associated with sharp-angled crotches and tough wood; growth habit adapted to the various uses

of the tree, for example, restricted upright growth for streets, tall upright for forests and broad spreading for parks and lawns; and lumber qualities—tough and straight-grained.

The work of the Division of Forest Pathology of the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering, in selection and breeding of elms was initiated in 1937 primarily to develop desirable elms resistant to the Dutch elm disease and *phloem necrosis*. American elm seedlings originating in the Great Plains and Northeastern and Central States were assembled in experimental nurseries near Morristown, New Jersey, and Columbus, Ohio. Each year, after the trees had been growing one season, those in the New Jersey nursery were inoculated artificially with the Dutch elm disease fungus to test for resistance. Of 35,000 seedlings so tested, only one satisfactorily withstood three consecutive seasons of heavy inoculations. The usefulness of this resistant specimen as a shade or forest tree, and as a parent possessing superior germ plasm for breeding resistant hybrids, remains to be determined.

Phloem necrosis cannot be transmitted by any known means other than by grafting tissue from a diseased tree into the healthy tree to be tested for resistance. After successful tissue union has been established, a year or more must elapse before symptoms appear on the grafted tree. For convenience in grafting, trees selected need to be somewhat larger than is necessary for testing for resistance to Dutch elm disease. Several hundred hybrids are now under test at Columbus, but results are not yet available. Any trees found to be resistant to either of the diseases will be tested for resistance to the other.

Selection of elms resistant to the Dutch elm disease has been carried on with some success in Europe. Among seedlings of Spanish origin, Dr. Christine Buisman of the Netherlands, discovered a resistant individual of *Ulmus carpinifolia* Gleditsch, the smooth-leaf elm of Europe. Specimens of this clone were imported and planted at Morristown in 1939. The trees appear to have retained their high degree of resistance but have failed to grow as rapidly as American elms nearby. Their juvenile form is somewhat conical and compact, and thus far there has been no marked weakness of branches such as has been reported from Europe. The usefulness of this tree for street and lawn planting and for a parent in breeding is yet to be determined.

During the past eight years the Division of Forest Pathology has also been hybridizing elms. Our native rock elm, *Ulmus thomasii* Sarg., like the American elm, is susceptible to the Dutch disease.

A desirable feature of the rock elm is its tough, straight-grained wood, whereas the wood of the American elm commonly is so cross-grained as to be difficult to split. The Siberian elm, *Ulmus pumila* L., sometimes incorrectly called Chinese elm, is highly resistant to both Dutch elm disease and *phloem necrosis*, but its usefulness as a shade or timber tree is definitely limited by its branching habit, brittle wood, and susceptibility to storm damage and winter injury. Attempts are being made through breeding to incorporate the desirable features of these three species into one individual.

Because of both genetical and practical limitations, the task of breeding elms is not altogether simple. Examination of the contents of the pollen grains and other reproductive cells reveals that the number of chromosomes—the bearers of hereditary characteristics—in the rock and Siberian elms is twenty-eight, while there are fifty-six in the American elm. This difference in chromosome numbers makes hybridization difficult. The best type of trees of each species should be chosen for parental stocks, and sometimes the individuals selected are located miles apart. This matter of distance often confounds the elm hybridizer. All three species of elms flower in the spring

ahead of the leaves, often at a time when cool, damp weather prevails, which is unfavorable for pollination and "setting" of seed. Then much of the hybridizing must be done on ladders since the flowers of the parental trees usually are inaccessible from the ground. The flowering period of the American and Siberian elms usually overlaps, but the rock elm blossoms several weeks later, which necessitates storing pollen and keeping it viable until needed. Or, if reciprocal crosses are made, it is necessary to force the flowers of the rock elm so as to have pollen available when the female flowers of the Siberian and American elm are receptive.

Elm flowers average about an eighth of an inch in diameter, and both male and female parts are borne in the same flower. In making controlled crosses, the male, or pollen-bearing, parts are removed from all flowers chosen to be female parents. This emasculation must be done carefully before the pollen in the flower is mature. Otherwise, the flower may be fertilized by some of its own pollen despite the fact that self-fertilization is not the rule under natural conditions.

With flowers as small as that of the elm, emasculation is a delicate, tedious, exasperating operation. Dualoupes, a type of magnifier worn like ordinary eyeglasses, permit fairly close observation and free use of both hands by an operator working with finely pointed forceps. A skillful operator may manage to emasculate forty flowers an hour—but it is not the kind of job that can be kept up all day. The period for emasculation lasts only about two days.

The hybridizer must work carefully so as to damage the flowers as little as possible. Even so, the mortality rate is high. A paper bag is placed over clusters of emasculated flowers to prevent any possibility of contamination by unwanted pollen from other trees. The female receptive organ, or stigma, is allowed to develop for a day or so before being dusted with pollen collected from the tree selected as the male parent. If the cross is successful, seeds usually may be harvested from six to eight weeks later.

To add further to the difficulties of producing seedlings, many hybrid elm seeds fail to germinate. Nursery seed rows must be maintained for two years because elm seed may remain dormant a whole season before germinating. In seedlings, adult characteristics of the leaf in regard to shape, color and thickness are not fixed; bark color, configuration and thickness have not developed; and the branching habit may not reflect the ultimate form of the tree. By the time some of the adult characteristics have begun to show, the young trees will



Experiments are being made with the Christine Buisman elm of Europe, resistant to Dutch elm disease



This young American elm has survived heavy inoculations of the fungus carrying Dutch elm disease

have become large enough to test for resistance to Dutch elm disease and *phloem necrosis*. If the tree withstands heavy inoculations for several consecutive seasons, it must still be grown a number of years in various parts of the country before its growth habits and general suitability can be determined. Results of inoculations indicate but do not prove that the hereditary factor that makes a tree susceptible to the Dutch elm disease may dominate the factor that endows it with resistance. This complication adds to the difficulty of securing resistant strains, but plant breeders have devised techniques to overcome such difficulties. If the new tree is resistant to disease but unsatisfactory in some other respects, it may still serve as a valuable parent in other breeding work.

The Division of Forest Pathology has attempted approximately 20,000 controlled American-Siberian elm crosses through emasculation of the flowers in the past eight years. Less than a hun-

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TEXAS ICE STORM

Greatest Timber Salvage Project Since New England Hurricane Launched in Wake of Widespread Damage

By W. E. WHITE

WHEN grey, misty skies settled over East Texas on January 13, no one suspected that they were the forerunner of disaster. Yet, forty-eight hours later thousands of acres of timber lay bent, twisted, broken and uprooted from probably the worst ice storm ever to descend upon the forests of this region.

stands between six and fourteen inches in diameter. In some instances young pine pole stands were completely eliminated by breakage, leaving only worthless hardwoods.

Young reproduction was bent to the ground but much of it already shows signs of straightening up. Some of it,

however, will bear the mark of the storm for life in crooked boles, forked tops and weak crowns. Some pine plantations suffered badly and the U. S. Forest Service estimates that twenty percent of its slash pine plantings were affected.

Other than the out and out damage to timber and reproduction a major calamity of the storm is the enormous fire hazard created by the tangled debris on the ground. This condition will exist in some localities for several years until the slash has rotted away.

Many hundreds of miles of wood roads are blocked, roads that are needed for timber management purposes and fire protection. About 750 miles of Texas Forest Service telephone lines were damaged and 440 miles will have to be rebuilt entirely. On two of the national forests affected, so much line is down that radios are being installed in towers and dispatching centers to bridge over the emergency. Foresters are also looking for further damage to timber from insects this summer which could easily reach epidemic stage.

Three major problems stand in the way of salvage operations—time, labor and transportation. In order to be able to utilize the damaged timber it must be cut and dry before hot weather sets in with its accompanying decay and insects. Pine sawlogs and pulpwood deteriorate rapidly after the first of June.

A labor survey in the damage area shows that there is not sufficient man-



The storm covered an area of approximately 8,000,000 acres in Texas and Louisiana. At least 2,000,000 acres suffered severe damage. According to Allen Miller, area forester for the Timber Production War Project, timber on approximately 400,000 acres is salvagable. National forest holdings were the heaviest hit, though eight lumber companies and other large timberland holdings reported severe damage. Farm-owned and non-resident woodlands also suffered.

The actual timber damage has been placed at 100,000,000 board feet in sawlogs and 1,000,000 cords of pulpwood in Texas. No estimates are available for Louisiana. Sawtimber trees as large as twenty-four inches in diameter were broken off or uprooted; but the greatest loss occurred in young pole

Not since the New England hurricane of 1938 has there been such great storm damage to timber. More than two million acres of valuable pine forests in Texas suffered severe damage, as shown above. At right, a stricken slash pine plantation



power available to salvage any appreciable amount of timber. Some of the companies are going ahead with their present crews and have already moved them into stricken areas. Some feel that little can be accomplished in the way of salvage because it will require far more manpower than the cutting of undamaged timber. On most of the small holdings, farmers are either getting ready to start spring plowing or are indifferent to the loss. It is estimated that at least 1,000,000 man-days' work are needed to salvage the pulpwood alone. Hauling the wood to the mills and railroads is a job for trucks and the Timber Production War Project estimates more than 800 will be required.

But despite these seeming unsurmountable obstacles, steps are being taken to hasten salvage of the ice damaged timber. Conferences have been held by TPWP among the industry and small landowners, War Production Board, War Manpower Commission, U. S. Employment Service and the Texas Forest Service. Plans are being developed to use war prisoners on the job—possibly as many as 10,000.

Based on a request of the War Production Board, the Secretary of Agriculture has given the U. S. Forest Service authority to set up a timber salvage organization along the lines of the New England salvage operation on hurricane damage a number of years ago. Funds amounting to \$3,000,000 have been provided for this purpose by the Disaster Loan Corporation through the Federal Surplus Commodity Corporation. Salvage operations will get under way as soon as possible. Using war prisoners to the extent available, the Texas Timber Salvage Project, as it is called, will recover and sell sawlogs and pulpwood as such to local mills. No processing of any kind is contemplated by the government. Salvage operations will center on approximately 100,000

acres of national forest land and, in conjunction with local agencies and lumber companies, on 300,000 acres of privately owned lands. It is planned to complete the undertaking by July.

Meanwhile, information is being assembled on the location of damaged holdings, amount of salvage timber available, locations of timber markets and prices. The Civil Air Patrol has developed a coordinated system of plane patrol over the area in cooperation with the Texas Forest Service and planes have been used to carry timberland owners over their tracts to survey damage and plan salvage operations. The San Augustine County Lions Club is taking the lead in mailing out 2,000 letters to farmers in their trade territory enlisting their help in salvaging timber on their farms.

The Texas storm grew out of what

was first a heavy mist and then turned into a light rain. With the temperature hovering right at thirty-two degrees the rain froze and covered everything with a clear coating of ice that continued to accumulate for two days. This occurred over a belt seventy-five miles wide north and south, with severe icing within a forty mile belt. Where the temperature varied only slightly from thirty-two degrees one way or the other, there was no icing.

Paul Hursey, forester for the Angelina County Lumber Company, who was caught out in the forest with his car bogged down, said the sounds of the storm reminded him of a huge Fourth of July celebration. "Trees loaded down with ice would just snap off with a loud crack. They were going down all around me."

When the sun came up over the piney



Federal and state governments will cooperate with land owners in salvaging ice damaged timber. Some farmers, whose woodlots were badly hit, as shown at left, have already started. One, above, is piling salvaged cordwood along a road for hauling to the local mill

woods on the morning of January 15 it was over a sea of sparkling ice, tons and tons of it, weighing down trees, fences, power line and communication systems. Silent, shimmering beauty—a fiendish power in disguise. But within two hours the ice was gone. A stricken forest remained.

Dr. Charles Carpenter, plant manager of Southland Paper Mills at Lufkin, sums up the whole situation this way:

"We have witnessed the destruction of a natural resource which is sorely needed. If it is not salvaged it will result in waste by fire, insects and decay unparalleled in the history of this section. It must be salvaged whatever we do."

It will take a lot of work and planning—but it can be done.

NAZI "FORESTRY"

By P. L. BUTTRICK

To keep his armies supplied with wood, Hitler is exploiting the forests of Greater Europe. How he is doing this and what the effects will be on postwar rehabilitation are graphically appraised here by Mr. Buttrick, who in the December issue told of the role the forests of the continent are playing in the present war.

IT IS well known that Nazi Germany attached great importance to wood as a war material—some say she considered it a key to victory. Lacking vast forest resources, her obvious plan in a gamble for quick victory was to overrun her immediate neighbors and exploit to the limit their resources of wood. Afterwards, the Nazis reasoned, they could draw on the rest of the world and restore Europe's forests at their leisure.

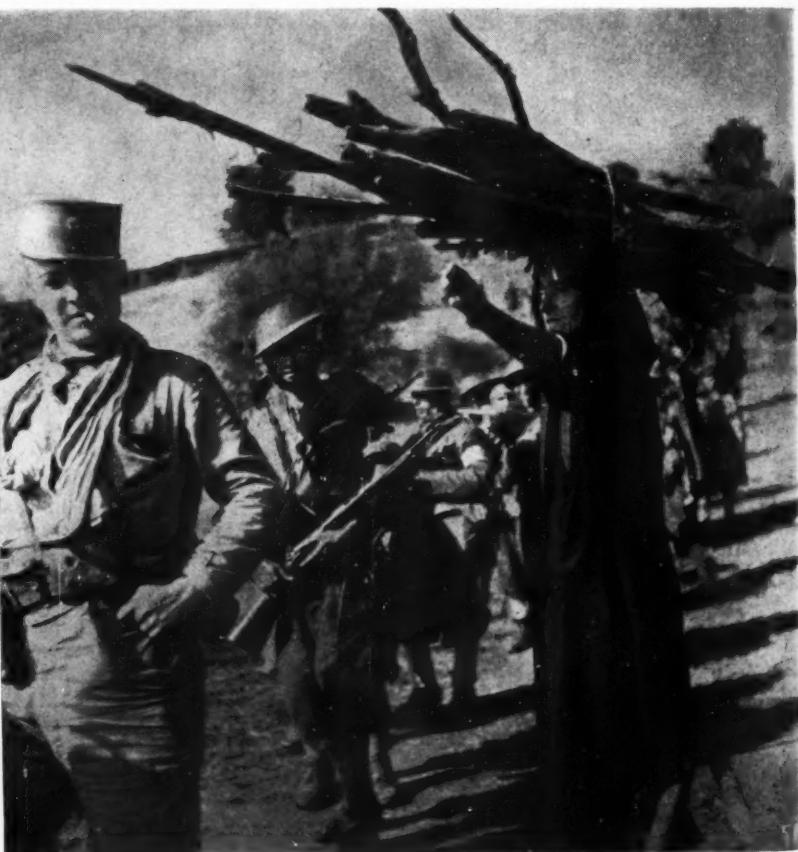
The quick victory Hitler promised his followers did not materialize, but it is clear that he has been able to get enough wood to keep his still formidable military machine going. His early conquest of neighboring forests is partly responsible for this as also were his intensive prewar investigations in the use of wood substitutes for other and scarcer materials, and the building up of stockpiles of essential forest products. This was accomplished largely by forcing trade "agreements" on Germany's weaker neighbors and obtaining control of scientific and trade associations concerned with forests and their products. Nor did the Nazis neglect to build up inventories of forest resources in other parts of the world on which they could draw if their U-boats could keep the sea lanes open.

In other words, Germany put herself in a preferred position in wood utilization techniques and European forest trade even before the military attacks began, and while she no doubt has been given more credit than she deserves for vastly expanding the use of wood into fields undreamed of a generation ago, she was the first to realize the revolutionary nature of the discovery that wood was a potential general raw material. And certainly she has gone farther in pushing this discovery into the production fields and was equipped before the rest of the world with plants capable of large scale production of wood-derived motor fuels, foodstuffs, textiles, lubricants and plastics, not to mention paper in new forms for new uses. She was equally far advanced in the adaptation of wood in construction, where other

nations would have used ordinary metals.

It cannot be said, of course, that all German prewar economic penetration into neighboring countries was designed to secure control of forests—other raw materials and strategic considerations were at least equally important—but it did materially increase the Nazi woodpile before a shot was fired. It was not big enough for a long war, however. To fight one, Germany had to depend in part on forests captured from her neighbors.

In appraising these forest conquests it is well to keep in mind that except for Russia, Europe is not heavily forested. Only Russia, Finland, Sweden, Czechoslovakia, Poland and Yugoslavia had significant surpluses for export. All other countries imported a portion of their wood requirements, even though their forests were an important domestic resource. In 1937, Germany had 31,268,000 acres of forest, but she had to import about a third of her wood product



A peasant wood gatherer aids French army of liberation in Corsica. Hitler replenishes his woodpile at expense of the peoples of occupied countries

requirements. By annexing Austria in 1938, she acquired an additional 7,700,000 acres, and a few months later gained more valuable forests by taking over the Sudeten district of Czechoslovakia. By the spring of 1939 the remainder of the Czech forests, totalling 11,500,000 acres, came into her possession.

The Nazis attacked Poland later in the same year and claimed about 10,000,000 of that country's estimated 19,500,000 acres of forests. The Russians acquired the other half. Hitler's share in this conquest, while not the best part of Poland's timber resource, was capable of supplying more than local needs, and it was easy to exploit. With the conclusion of the Polish campaign, the Nazis found themselves in control of a forest area nearly as large as that of Germany itself.

The next move was by Russia when she took over Estonia, Latvia and Lithuania containing 9,000,000 forested acres. Soon afterwards a small portion of Finland was annexed. Later

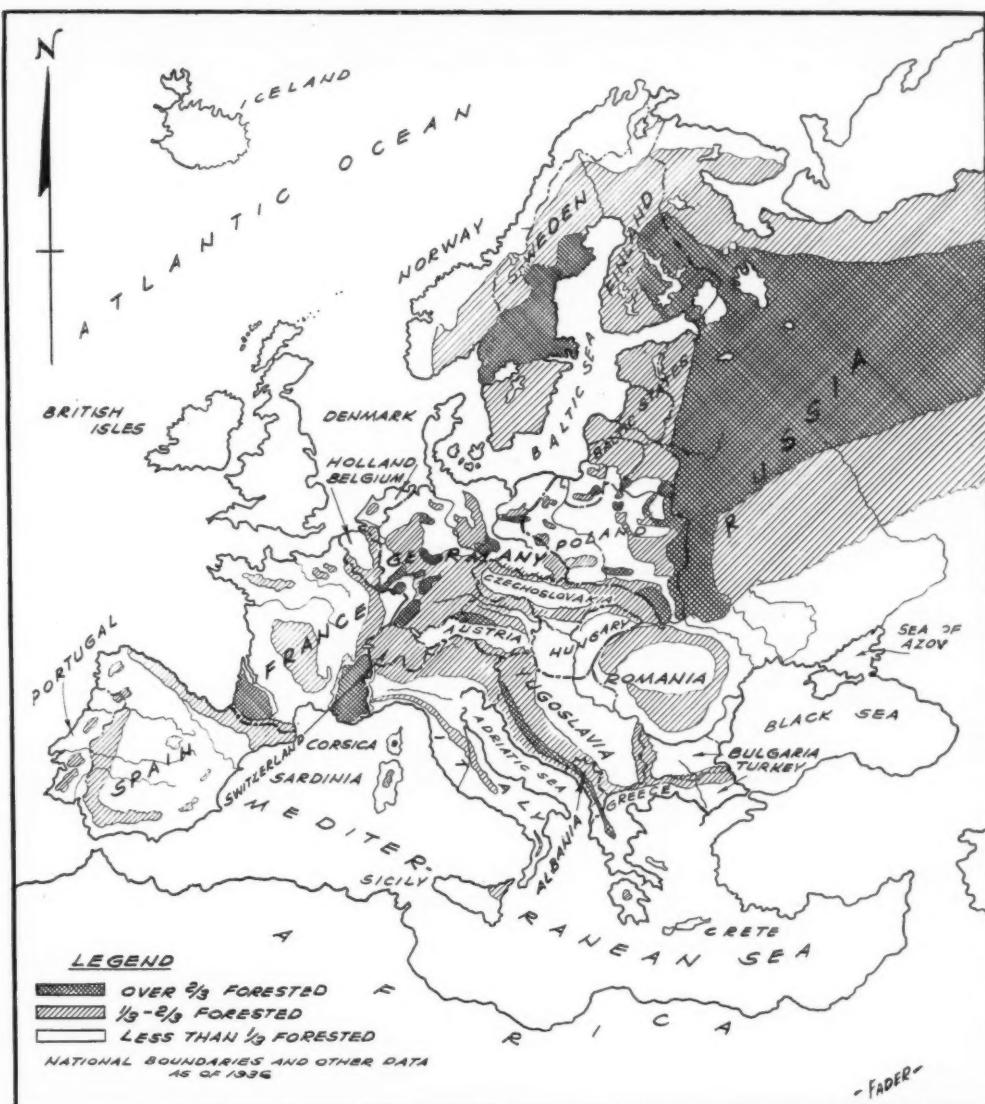
Romania was forced to cede Bessarabia, which, however, was not heavily forested. Russia already had forests in abundance, but the Soviet occupation kept these additions out of Nazi hands for many months. From a forestry point of view, the Finnish territory on the Karelian Isthmus near Leningrad was probably the most important, as it was the center of the Finnish pulp and paper industry, probably the second most important in Europe.

After Poland the Nazis speedily overran Denmark, Norway, Holland, Belgium, Luxembourg and France. The forests of Denmark, Holland, Belgium and Luxembourg were small, totalling around 3,000,000 acres, but they lay close to Germany and could easily be exploited without transportation difficulties to con-

tiguous parts of the Reich.

Norway's 18,500,000 acres of forest were more valuable. Also, possession of Norway gave the Germans a land connection with Sweden and Finland, two of the most important forest producing countries of Europe, and increased her economic dominance over them. Sweden's forests cover 57,280,000 acres, those of Finland 62,116,000 acres.

The forests of France—about 26,000,000 acres—were also a rich prize, particularly her hardwoods, among the best in Europe, and her extensive southwestern pine forests, the chief naval stores producing region of Europe. Then, too, the French forests are generally accessible. Control of France opened the way for importation without danger of forest products, especially cork, from Spain



At the peak of their conquests, the Nazis controlled a vast forest empire—180,000,000 acres, or about one-half of the forest area of continental Europe, excluding Russia

and Portugal. It also opened up the cork forests of French North Africa, as well as its potentially important pulpwood resources—subject, of course, to interference from the British fleet.

In the spring of 1941, the German army blitzed its way down the Balkan Peninsula, driving the Yugoslav army into the forests fringing the Adriatic. About the same time the Nazis drew Hungary, Romania and Bulgaria into their "New Order," thus coming into control of 52,000,000 acres of Balkan forests. Yugoslavia contributed 19,000,000 acres, Romania 17,700,000, Hungary 3,000,000, Bulgaria 7,000,000, and Greece, including Albania, 5,900,000 acres. These figures are those of 1936, before Hitler, Mussolini and Stalin began juggling boundaries.

In Yugoslavia and Greece, Nazi control of large forest areas was nominal. Patriots of both countries retreated into them and kept on with the war. Yugoslavia has the best forests in the Balkans and was an important timber exporting country, but the Greek forests are mostly noncommercial. It also should be mentioned that although Italy has a large forest area, most of it is of little economic value. From a forest products point of view, Italy was probably a German liability. Switzerland is not an exporter of forest products and European Turkey is mostly non-forested.

Thus, when Hitler attacked Russia in June 1941, Germany, without deductions for areas where guerrilla warfare or other factors rendered her control incomplete, was in possession of approximately 130,000,000 acres of forest, plus her own 31,000,000 acres. Before the Soviet counterattack in November of that year, the Nazis had taken the more accessible forests of European Russia, plus those of the countries the Russians had occupied. At a very rough estimate, the Germans overran as much as 50,000,000 acres of Russian forests, the most valuable portion of which they held for at least two years. Some of this is still occupied. The total area of forests in European Russia is variously estimated at between 500,000,000 and 600,000,000 acres. Thus, Germany, at the extended limits of her forest empire, had control of approximately 180,000,000 acres of forest. This is equal to about one-third the forest area of the United States.

All European countries, like the United States, have public forests. In the occupied regions such forests, including Russia where all forests are nationalized, amounted to over 130,000,000 acres. Germany, as a conqueror, treated all public forests as German property. In such countries or parts of countries as she formally annexed, the public forests became in her eyes part of the German public forests. Where occupation was military or civilian they were put under separate German administration.

Every country in Europe exercised some control over private forest exploitation. The Nazis increased these controls both at home and in the annexed and occupied regions and issued orders to private owners as to what and how much they should cut. Under International Law, an occupying country has the right to requisition supplies—which, of course, includes forest products—but is required to pay for them. When Germany has done so, payments have been made chiefly in worthless paper.

Another way of obtaining possession of other people's property has been to transfer ownership of forests and forest industries to favored German nationals and highly placed quislings. Methods

run from outright confiscation to transfers which, as the lawyers say, give "color of legal title." Among them are transfers of management to German-appointed trustees, and forced purchases with depreciated currencies. Still another method is to establish German-controlled cartels. German industrialists then freeze out the original owners. How many millions of acres of forests and how much forest products producing capacity have passed into German and quisling hands cannot be estimated. Not the least of the problems of making Germany disgorge her ill-gotten forest domain will be in the unravelling of such transactions.

The Germans were long among the world's leaders in forestry. What has been their record in forest management since the Nazis took over? Something is known about their plans to overcut—and about their successes and failures. They have undoubtedly cut more than the annual growth in many places and taken little thought for future growth in others, but the total extent of damage is as yet indeterminable.

When the Nazis came into power the cut in German forests was increased to 150 per cent of sustained-yield capacity. Doubtless this figure was also later apportioned to Austria.

The German press hints that overcutting in Germany is worrying the authorities. In April 1943, Secretary of State Alpers is quoted as having said: "In view of the longer duration of the war, the needs of silviculture must be taken into consideration in the utilisation of timber if irreparable damage to the German forests is to be avoided." As to the immediate future, he said "no relief can be expected in 1944 and felling will be at the 1943 rate." Since this statement was made during a series of meetings held throughout Germany and the occupied regions to increase timber production, it seems evident that the Nazis are seriously overcutting on the one hand, and are not getting as much timber as they want on the other. Information dated as late as October 1943, tends to confirm this.

In Czechoslovakia, one of the first Nazi acts was to order cutting stepped up 150 percent of normal. Germany set up in part of this country the so-called independent state of Slovakia. Here, according to Erderly in his book, *Germany's First Protectorate*, it is stated that "the forests are now being made to yield 23,000,000 cubic meters of wood annually against 7,500,000 cubic meters before the war." This is about 300 percent of the Czech rate. Probably the Slovakian forests were undercut before the war, so this may not be as serious as the figures suggest. It is reported, moreover, that Slovakia, in 1942, was unable

to meet her quota of timber exports to Germany. The Nazis opened up this formerly largely unexploited forest region by building logging railways and new mills.

The Nazis divided their share of Poland into two territorially equal parts. One, called the Incorporated Territories, was annexed to Germany and its timber cut ordered stepped up to 150 percent of normal. The other, called the Government General, is administered under a colonial status. As to what happened to the forests in the latter, a reliable Polish report has this to say: "As a rule, timber is being cut at the rate of twice the normal yearly cut, but each district has a designated quota it must deliver. Actually, the cuttings sometime reach the fantastic figure of five to seven-year volume in one year. As an instance, the forests in Lochow were ordered to deliver 60,000 cubic meters in the first year of the occupation instead of the normal cut of 8,000." According to another report from this source, "the Germans admit that the exports (to Germany) represent a maximum exploitation of Poland's resources and will result in the complete crippling of the lumber industry in Poland for a long period."

Norway, on the basis of Nazi orders, seems to have fared better. The Norwegian Information Service reports that in 1941-42 the Nazis ordered fellings increased to 115 percent of the annual growth, but for various reasons the actual cut was only ninety-five percent. This does not, however, appear to apply to northern Norway, where local requirements for Nazi military uses were high and serious overcutting, made without the slightest regard to forestry practices, is reported to have occurred.

The French press states that a Vichy law of 1940 requires private owners to cut 150 percent of their normal production each year. Such an overcut would be serious since French forests have not recovered from the last war. If cutting has not reached or exceeded this figure, lack of manpower is probably the reason. *Le Patriot des Pyrenees* last May stated that loss of foreign labor, war prisoners and German drafts have reduced forest labor by half.

Conditions in Holland, according to a British publication, are much the same. German requisitioning has been so great that the future of the small Dutch timber industry is in grave danger. Forest owners have been forced to cut even immature stock on an extensive scale.

As to Belgium, a decree issued last summer attempts to assure continuation of wood supplies. Each dealer, states a report, must furnish a "certain quantity of wood, for which a premium of fifty

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HIGHLIGHTS OF AFA BOARD MEETING

MEETING in Washington on January 26 the Board of Directors of The American Forestry Association by resolution took the following action:

Opposed the provisions of the Hatch bill, S. 1463, to centralize in the General Land Office of the Department of the Interior facilities for the acquisition and disposition of federally owned and controlled land. Its position was based on the grounds that, if passed, such legislation would "cause duplication, delay and inefficiency in the handling of conservation work on lands owned or controlled by the United States."

Reaffirmed its opposition to a provision written in the Agricultural Appropriation Act by the last Congress prohibiting the expenditure of federal Dutch elm disease funds in any state which does not provide for removal of diseased trees by property owners, and called upon Congress to rectify the provision.

Authorized an increase in the Association's operating budget for 1944 to expand editorial, educational and membership activities.

Named Erle Kauffman editor of *AMERICAN FORESTS*. Ovid Butler, editor since 1923, will serve in an advisory and executive capacity as editor-in-chief. Mr. Kauffman has been an associate editor since 1928 and is well known to the membership and to readers of *AMERICAN FORESTS*.

In reporting on the Hatch bill, S. T.

Dana, chairman of the Board's Forestry and Land Use Committee, stated that it could be interpreted as providing the General Land Office with power to build up a central federal agency dealing not

tached thereto. Should this interpretation be correct, he said, it would complicate and jeopardize the present management of the national forests and other federal conservation lands, as well as the government's forest acquisition program. He felt that it would inject confusion into the government conservation work and set up another federal agency duplicating the work of existing bureaus charged with the administration and development of federal conservation lands.

William P. Wharton, chairman of the Board's Forests, Parks and Recreation Committee, reported that congressional action in withholding federal funds for the control of Dutch elm disease from certain states is in the main responsible for the \$33,000 decrease in appropriations recommended for the next fiscal year. The provision made by the last Congress prohibiting the use of federal funds in states not removing diseased trees is, he pointed out, embarrassing the whole control program. His committee urged that steps be taken to remedy this situation.

The increased operating budget authorized by the Board is designed to strengthen all activities of the Association, with particular emphasis on its educational work.

In view of war conditions, the Board voted not to hold an annual meeting of the Association during 1944.



Erle Kauffman
Named Editor of American Forests

only with federal lands but also with improvements, leases and resources at



Walter H. Meyer



Louis Bromfield



Henry P. Kendall

New Members of the Board of Directors of The American Forestry Association. Mr. Meyer of Connecticut, and Mr. Bromfield of Ohio, will serve until 1948, Mr. Kendall of Massachusetts, until 1945

AGING TROUT

From Fingerling to Frying Pan in Six Months Is the Triumph of Science

By CLAUDE M. KREIDER

A MAGIC highway in eastern California leads north across the Mojave Desert, from the heavily populated southern area, to skirt the base of the magnificent Sierra. Past Mt. Whitney and kindred giants, it climbs gradually to the 7,000-foot belt—and paradise for the vacation angler. That is, the Inyo-Mono country once justified such celestial status. The many cold streams which pour down

from the snowfields and the countless lakes of the sub-alpine belt, all contributed to the pleasure—and larder—of the vacationist who wanted trout. The “ultra” dry fly expert found his heaven in the Owens River and other placid, meadow streams. The seeker of prize rainbows communed with the gods on magically productive June and Mammoth lakes, where trout “as long as your arm”

were really not uncommon. Women and children took pan-fish as needed from waters almost anywhere near camp.

But such idyllic conditions could not survive the increasingly heavy annual catch, which reached its peak around 1938. The mountain grandeur was still there. The magnificent forests of pine and fir still beckoned, with comfortable camping spots tucked in their midst. But no longer could the casual angler bring in a creel of rainbow, brown, or brook trout. And even the expert, with diligent work, could barely supply the frying pan.

These conditions had not escaped the worried officials of the State Division of



Rearing ponds at California's new Hot Creek Hatchery where controlled water temperatures "age" more than a million fighting trout each year



Sampling the hatchery-reared rainbows in a well-stocked stream just below the ponds—an unexpected opportunity afforded all visitors



Brood fish in these ponds spawn in the autumn instead of the spring

Fish and Game, and there was no intention of permitting such a potentially rich area to become virtually barren. The great Mt. Whitney hatchery, intended especially to serve the eastern Sierra drainage, which had operated since 1916, failed to maintain the trout supply. This was due, perhaps, largely to the fact that a high mortality rate occurs



One of the many lakes in the Sierra being restocked with hatchery-aged trout. A month after planting, eight-inch fish may be taken—ten-inchers in four months, if you know how to get them

in small trout taken directly from hatchery troughs to mountain waters. The percentage of such baby fish that survive flood, poor food conditions and predatory large trout is pitifully small. And even the survivors required at least two years to reach "catchable" size. Their growth, particularly through the long, cold winters, is almost negligible.

The solution then seemed to be "aged" trout, forced to rapid growth under controlled conditions, to be placed in appropriate waters, ready for the angler, with loss of fish through the transition stage so small as to be a minor factor. And thus was evolved the new Hot Creek Plant at the eastern Sierra base, right among the waters that needed the fish. And here occurs the phenomenon of raising baby rainbow trout that are spawned in the autumn, instead of spring, when orthodox rainbows assume the business of raising families. And the added—and highly important—feature of forcing growth through controlled water temperatures.

Little Hot Creek is something of a paradox. It flows down from the mountains as pure, cold spring water, to be joined at the hatchery site by both warm

and cool springs, which permit exact control of water temperature the year around. Thus, little fish that are placed in the long rearing ponds grow at the phenomenal rate of an inch a month, or from tiny fingerling to frying-pan size in six or seven months. And in 1942 this newly operating plant reared, aged and planted in nearby, heavily-fished waters 1,382,000 trout!

The principal reasons for the fast growth of the fish are explained by Alan Taft, chief of the state's Bureau of Fish Conservation. Added growth, he said, is not due altogether to high water temperature. Its freedom from contamination and the fact that it makes possible a growth of scuds (fresh water shrimp) and other aquatic food which forms a small but nevertheless important part of the diet of the trout, are also important factors. But this does not convey any idea of the long experimentation, scientific study and expense of bringing the Hot Creek Hatchery and rearing ponds from a modest start to their present state of productivity.

The present modern plant, replacing a small experimental station, resulted from Mr. Taft's scientific studies and the

keen interest of the California Fish and Game Commission. Sierra summers are short and the snow lies deep in Hot Creek Basin through the winter, so speed was essential. The first work began in the spring of 1941, when power equipment moved in to start levelling new building sites and excavating the rearing ponds. By October of that year the plant was in the process of turning out new trout to start the replanting program.

The completed installation included a new and modern hatchery building containing thirty long troughs, with a capacity of nearly 1,000,000 baby trout. There are thirty rearing ponds, twelve feet wide and a hundred feet long, with natural gravel bottoms, contoured to promote aquatic growth so necessary to the rapid development of young trout. The ponds are fed through concrete flumes with just the proper flow of clean, uncontaminated water at the unvarying temperature of sixty-three degrees. Thus, every day through the long winter is a feeding and "growing" day. There is no long period of hibernation as in the icy waters in that locality.

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FIRE PREVENTION WHERE IT COUNTS

Facing the Facts About Man-Caused Fires—and What Can Be Done About Them

By JOHN CLARK HUNT

IT has become something of a national habit to blame "outsiders"—city campers, tourists, fishermen and hikers—for the great bulk of our man-caused forest fires. "These people start fires because they do not know how to conduct themselves in the woods," is a statement so often heard in local forest communities that it has become commonplace.

At first glance, it may appear to make little difference where the forest is concerned whether a fire is started by a local resident or a city visitor. In either case, the forest suffers. But to those engaged in fire prevention work it is of vital importance. There is no point, for example, of spending a great deal of time and money selling fire prevention to local inhabitants if vacationists from distant towns and cities are responsible for the fires.

But are they? Is the "outsider," as local people contend, our Number 1 problem in fire prevention? The United States Forest Service does not think so. After a comprehensive study of the fire situation in California, the Service made the statement that from forty to

sixty percent of the man-caused fires in that region were started by local people living in or adjacent to the forest. In the South, where for a score of reasons forests are either intentionally or carelessly burned, professional fire control men will tell you the percentage is even more favorable to the "outsider."

The most convincing evidence against the habit of blaming almost every fire on the carelessness of vacationists, however, has been developed by the war. Rationing and war work have restricted recreational travel by more than fifty percent. In areas where most forest fires occur the decrease is even more marked. According to a national travel association, the 1942 decline in the Pacific Northwest was around eighty percent, from forty-four to eighty-five percent along the Atlantic Coast.

Yet in spite of this decrease in recreational travel, the number of man-caused forest fires in 1942 increased by more than 8,000. An area approximately the size of New York State was burned over —5,000,000 acres more than were burned in 1941. Of the 208,000 fires re-

corded for that year, only 7,000 were caused by lightning. The others were man-caused fires and preventable.

More than fifty percent of the "outsiders" at home working, yet man-caused fires increase! How can this be explained? There is only one answer. Man-caused fires, for the most part, are the work of local people. The 27,000 incendiary fires reported in 1942 were set by the same hands that brandished the torch in previous years; fires resulting from debris burning are and always have been the work of those living or working in or near the forest; and at least half of the 18,000 smoker fires must be scored against local inhabitants.

Some have attributed this increase in man-caused fires to war tension and carelessness on the part of woods workers, among them many "outsiders" brought in to replace experienced woods-men called into the armed services. Undoubtedly fires have resulted from this situation, but it is foolish to conclude that imported labor was responsible for our shameful fire record in 1942. Nor, it would seem, are war workers

in critical forest areas responsible. P. A. Thompson, chief of fire control for the Forest Service, has stated that observations made on the Angeles and San Bernardino national forests in California, revealed little evidence to support any notion that the jump in man-caused fires in that area was due to the influx of war workers. On the other hand, special problems affecting limited areas, such as railroad fires, definitely contributed to the man-caused record. Whether this portion of the increase was caused by added activities or use of inexperienced men, or both, is not known.

Throughout 1942 widespread concern over forest protection was reflected month after month in the press. High ranking military men joined forest officials in urging the people of the country to prevent fires. Yet in August, one national forest reported a 300 percent increase in fires with this pointed observation: "Local residents are culpable in the main for the rise."

Thus 1942, our first year at war, provided conclusive evidence that local people and not "outsiders" are responsible for most of our man-caused fires. If we accept this, as certainly we should, the next step is to orient our fire prevention

efforts to reach those who live in or near the forest.

This is not an easy job. Fire prevention is a task in education and the right psychology. To apply it to a large number of people generally resistant to the idea calls for carefully planned methods and unceasing effort. Local people, as a whole, usually fail to see the serious damage caused by fire. Unless they lose their homes, barns, or livestock a fire ordinarily means very little to them. Values such as watershed protection, prevention of soil erosion and a future timber crop are rarely considered.

One national forest supervisor, with twenty-five years' experience in dealing with local people, appraised the problem something like this: "When you talk to local people about preventing fires they seldom listen. They take the attitude that since they were born and raised in the woods they know more about the forest and forest fires than you do."

"It's different with outsiders. The forest is strange to them and they accept the forest officer as an authority. When he explains fire hazards and the damage fire causes, they are interested and usually follow the advice given them.

"Local people are not like that, and as

a consequence they are a daily fire risk from the time the forest is dry enough to burn in the spring until rain or snow falls in the late autumn. They use fire in their homes and work, and they smoke as much and as carelessly as the outsider. They hunt, fish and camp and go into the out-of-the-way places of the forest. Yet when they are careless with the use of fire, they will tell you how careful they are and have always been."

Granting all the difficulties of reaching local people, it can and must be done. If this were not true, our forest fire picture would be blacker than it is. Unfortunately, the success of fire prevention is intangible; we can look at the record and see how many fires were started each year, but we do not know how many were *prevented*. We also know that protection against fire has played a leading role in American forestry. This will continue until fire prevention has reduced the annual number of fires to the very minimum. Human nature being what it is, however, there will never be a time when man-caused fires will not occur. But a noteworthy decrease in the number of fires can be accomplished by coordinated fire prevention.

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Recreational use of the forest is off fifty percent—yet man-caused fires increase. This, says the author, points an accusing finger at the people living in or near forest areas



BLUE RIDGE MOUNTAIN MAYHEM

Southern Appalachian Mountain Men Have Fought and Died to "Protect Their Rights" in Their Own Remote Woodlands—and on Distant Battlefields

By CHARLES R. ROSS

AMERICAN frontier life was pretty rough on its far edges. A few men were lawless, some were bullies, and other men who wouldn't put up with such got in their way sometimes. Also, there were men, not lawless, who would die before allowing the other fellow's claim to certain prerogatives. Men knew that sur-

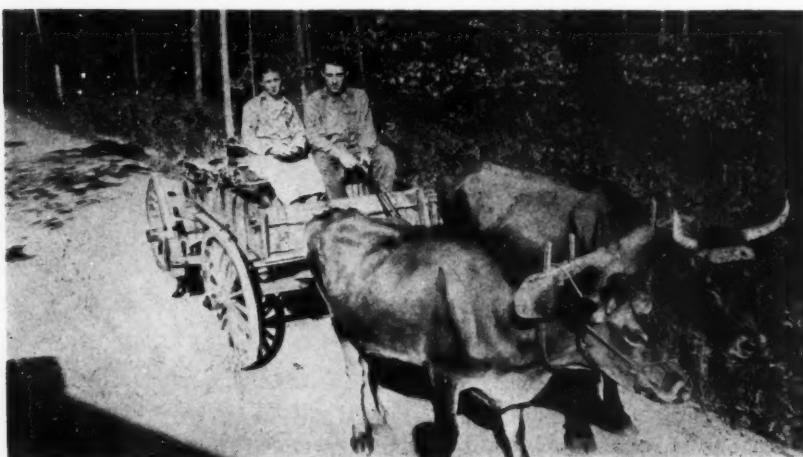
vival depended on their own resources. They learned to act accordingly.

By all rights such customs should have died out decades ago after law and order officially caught up with the frontiers. But a few areas like the Southern Appalachian mountains remained very isolated, and the old hell-raising lasted.

The feuding mountaineers, along with the quick-triggered men of the western cow country, outdid all other groups in their efforts to make homicide a household experience.

Few people realize how dangerously men have lived in the rugged southern backlands. Buried for more than a hundred years off to themselves, many mountaineers knew no code but that a man must take the law in his own hands. This attitude was furthered by the difficulties of organizing effective law in poor, isolated settlements.

Perhaps no individual is better qualified to review the recent hazards of living in the southern mountains than Forest Ranger Arthur Woody. This old-time woodsman has always lived in the near-forgotten mountains of northern Georgia, where for thirty years he has looked after 250,000 acres—the Blue



Although "bushwhackin'" about vanished with the advent of good roads, life is still primitive in the southern hinterlands

Ridge District—of the Chattahoochee National Forest. Born and reared near his present home, this ever-smiling, humorously profane giant is probably the best known and certainly the most picturesque of Uncle Sam's thousand or more forest rangers.

"So you want to go back over some of the rough times we've had in here an' about," was his reply when I suggested he accompany me on a fifteen mile trip into the Blue Ridge. "Well, we've had 'em bumped off pretty regular all over this country. Up 'til a few years back people never thought 'bout a killin' scrape as somethin' 'specially unusual. Course I'm glad to see that changin'. Why, if I could remember all the fightin' just in my boundary, it'd make a big book."

We set out from Dahlonega, driving northward on a paved road and soon turning off westward on a minor gravel one. Ahead, possibly eight or ten miles, loomed the Blue Ridge divide, state-strid- ing rampart of the Southern Appalachians. But this was lost behind the foot- hill ridges as we entered the Chattahoochee forest.

Crossing Bull Creek, we came into a large clearing. Here Ranger Woody pointed to an old two-story house standing close to the road. "This is where we meet up with Jep Hale, a feller that'd strike like a rattler if anybody got in his way. He's still livin', but I don't know where. One night 'bout twelve years ago he an' his brother were in that house when three men came walkin' up the road. Seems like they was all layin' for each other. Had a regular battle. Rifle shots from out that window killed two of the men in the road an' tore up the other. They say it was a quarrel over likker blockadin' like most fights back about that time. Jep was the bell goat for one bunch an' his side won."

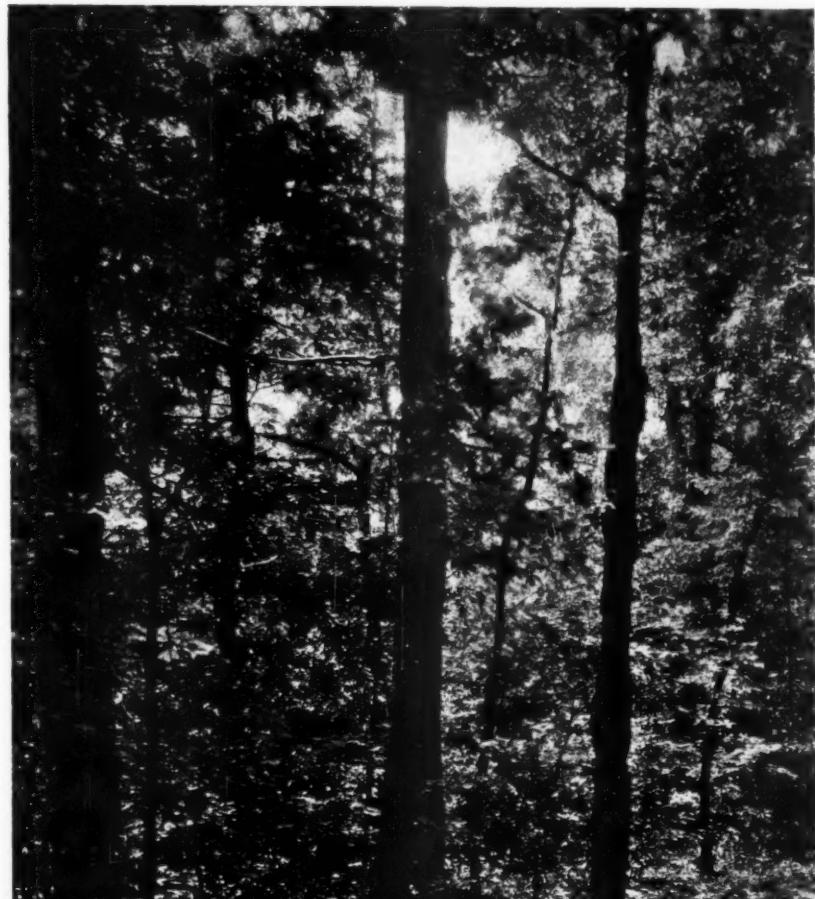
We appraised the house in silence before Ranger Woody chuckled and went on. "Had a run-in with Jep myself 'bout five years back. Was out on a trail with Vann Elliott, a CCC foreman, when all sudden-like a shotgun load came tearin' through the bushes *k-wham-m-m*. Then here come another 'un, *k-wham-m-m*, knockin' the leaves on us. I told Vann, 'You go back to the truck an' get my rifle—I'm goin' to slip up on this bird.' Next thing I heard was the feller goin' down the trail, so I got behind a tree. When he got close, I turned the tree on him an' grabbed him 'round the arms. It was Jep, but for a wonder he didn't resist. Said he was just tryin' out a gun. Not havin' any certain proof for holdin' him, and no real hankerin' to neither, I let him go."

Old Monty Pelham was down the road "livin' out his last years a lot quieter than he was once." As we approached

his log house, the ranger unfolded this story.

"Round fifteen years back, Monty, Coon Lee an' some more were in a scrape with another bunch. One of the other crowd, a feller Joe Edmonson, shot

Coon right above the left eye. Took him all day to die. There was more shootin', an' more people shot, but Monty an' Coot Cantrell got Joe Edmonson. They aimed a pistol at him but it snapped, so they ran him down and caught him at a



Along shaded paths through country such as this, Blue Ridge mountain men often fought to the death



Forest Ranger Arthur Woody "got along" with the feuding mountain- ers in Georgia for thirty years

foot log 'cross the next creek above here. They cut him up with knives. Monty had several years on the gang, but he's been a mighty good citizen for a long time."

He is, indeed, a quiet, kindly moun-

died in killin's. Frank Blake's got three boys buried there, all killed by the Dunn family. Think only one Dunn got killed. When the guv'ment was buyin' land down there things was so rough a feller'd think twice before travelin' through."

Our road ascended a long buttressing spur flung out from the Blue Ridge. We twisted sharply in and out of ditch-like hollows that corrugate the walls of these ancient Appalachians. Higher, the lands below us rose into view, unfolding a forty-mile panorama over foothills sweeping out to merge with the vast plateau of the southern Piedmont. Another mile and we attained the summit, stopping to watch the tributary ridges fall away in rolling billows.

These beautiful highlands were the beloved home of the Cherokees until 1838. Some of the cleared fields below us were those of the redmen. Their stone-ringed graves may yet be seen in the forest, and old trees are said to bear their curious markings. Indeed, recollections of Indi-

settler over there—came from Virginny. When the Confederate War broke loose, he's his oldest boy slipped off like Cooper and a bunch of 'em to fight on the Union side. He was a color sergeant at Gettysburg an' had two flags shot out of his hand. The same old home guards caught my grandmother's brother, Aaron Seabolt, when he slipped back in to visit his family on the other side of the ridge. They stood him up against a hickory tree and shot him.

"There's a story how them bushwhackers caught him. A neighbor girl came to his house pretendin' to be after meal and fire. It was thought she informed on him. That same woman died a few years back, but what she done as a girl was still worryin' her. She kept sayin' 'meal an' fire' when her mind got to wanderin'.

"A boy, Tom Galbraith, lived with my grandfather Woody. He was a Union soldier and the home guard hung him to an apple tree down on Long Branch. But my great-uncle, Ike Woody, he joined the Confederates. When they first put a ranger office in here and had the American flag on a pole, old Ike would see it and kinda growl to himself, 'Don't like it—don't like it—shot at that flag too many times.' My father got killed by a boy he helped raise. But I don't have to keep talkin' 'bout my folks to bring in killins'. We're nowhere near run out along this road. Let's be headin' off to 'rds the west."

On top of the Blue Ridge we looked over into the Toccoa Settlements. "I reckon if I tell you 'bout one feller who lived down there, it'd be enough for that settlement," the ranger observed. "His name was Juan Gurley—but he was always called 'Jew-Ann.' Well, he shot three men down there an' hid out from the law for thirty-three years. Only caught him by accident few years ago. Had a brother, Marion, that always stuck by him and folks was really more afeared of Marion than they was of Jew-Ann.

"When he was just a young boar shoat, Jew-Ann shot Lewis Hawk. Then he slipped into the forest where he lived out like a bear, scratchin' an' scrowgin' the best he could, eatin' berries an' killin' a few animals. Hawk didn't die an' if Jew-Ann had give up to the law he'd gotten off light, but he had got the notion he never would let the law touch him. So he stayed on hidin' out in those woods with Marion watchin' out for him an' slippin' him in his house once in a while. After a few years, Jew-Ann come to live more in the open, but he an' Marion toted guns like a sheriff an' the other settlers let 'em be.

"Things kept rockin' along this way for fifteen years or so, when one morn-
(Turn to page 126)



The old Hight cabin, scene of Jew-Ann Gurley's early morning "shootin' scrape." Above, typical mountaineer, unbelievably hardy

taineer now past seventy. As we looked down over his rustic farm we reflected that he has survived more perils than most men with battlefield experience.

We moved into the dappled shade of closed woodland. Farther ahead we could see a tiny clearing on a knoll, also a road junction and a one-room frame schoolhouse. Approaching the gullied school yard, Ranger Woody pointed to a number of gravestones. "Most of the men buried there died with their boots on, as they say. Must be a dozen. That'll give you an idea of what a killin' country this has been, because families live more'n a mile apart. But this neck o' the woods ain't no great shakes besides the Nimblewill. That's the next creek below here. In the Nimblewill churchyard there's twenty-five men buried what

an life are still vivid here, and they move one to wonder, as the ranger tells of white men's deeds, if the country was not more tranquil when the redman possessed it.

"This place is Cooper's Gap," Woody was saying, "named after a settler who had his home where you see poplars growin'. An awful mean thing happened here back in the Confederate War. Cooper slipped off to soldier for the Union, and while he was away a lootin', killin' bunch that called themselves home guards rode up to his home at this gap and killed his little twin boys—shoved them off the rock there.

"That's Black Mountain sticking up from the Blue Ridge there, an' my house is 'bout a mile down the far side. My grandfather, John Woody, was the first

THREE NAMED TO APPRAISAL STAFF

Field Work on AFA Project to Get Under Way in Maryland Early in March

APPOINTMENT of three regional consultants to the staff of The American Forestry Association's Forest Resource Appraisal has been announced by John B. Woods, project director. They are P. L. Buttrick for the Northeastern Region, Charles R. Ross for the Southeastern Region, and Roy C. Brundage for the Central States.

At the same time it was announced that field work will get under way early in March. As a result of a series of conferences with Joseph Kaylor, state forester of Maryland, plans are being developed to initiate work in that state in cooperation with the State Forestry Department.

Maryland is included in the Northeastern Region, along with Delaware, Pennsylvania, New Jersey, New York and the six New England States, and work there will come under Mr. Buttrick's jurisdiction. A graduate of the Yale School of Forestry, Mr. Buttrick's long career in forestry has been divided between public and private enterprise. For the past year acting forester for The American Forestry Association, he previously had served as secretary of the Connecticut Forest and Park Association, as professor of forestry at the University of Georgia, and was in charge of the Northeast Conservation Land Unit of the Resettlement Administration. About fifteen years ago he conducted a survey of cork oak stands and production prospects in Southern Europe and North Africa. He is the author of the recent textbook, *Forest Economics and Finance*.

Mr. Ross, who will be assigned to the southeastern states of Virginia, North Carolina, South Carolina and Georgia, studied forestry at the University of Georgia and at the University of Washington, where he received his Master of Science Degree in Forestry. His early experience was with the U. S. Forest Service in the South, including a year at the Appalachian Forest Experiment Station. In 1939 he became assistant extension forester of South Carolina, transferring to Alabama two years later as extension forester.

Mr. Brundage has been a member of the faculty at Purdue University since 1930. A graduate of the New York State College of Forestry and of the University of Michigan, where he received his degree of Master of Science in Forestry, he has also studied economics and statistical methods in the graduate school at Purdue. As an Associate in Forestry at Purdue, he conducted numerous studies of forest growth and management in the Central States, experience which clearly will be of great value in the forest appraisal work ahead in Illinois, Indiana, Ohio, West Virginia and Kentucky.

Commenting on the inauguration of work in Maryland, Mr. Woods made this statement: "While the Appraisal is

primarily interested in the facts about present and future wood supplies, the field work incident to developing such information may well serve as a basis for land use planning in all its branches. The people of Maryland are vitally interested in wildlife management and recreation possibilities. Farmers and industrialists are similarly interested in the control of erosion and the retention of ground water supplies. The State Forestry Department has a special interest in an analysis of conditions surrounding the protection of forests from fires, insects and diseases. Such studies may well be carried on in connection with the field work about to be started under Mr. Buttrick's direction."

Mr. Woods also stated that conferences have been held with J. M. Tinker, state forester of Georgia, and it is expected that field work for the Southeastern Region will begin in that state. This cooperative project, in which the facilities of the State Division of Forestry and those of Georgia Tech will be joined with those of the appraisal project, is expected to be concluded in six months.

Contributors to the project now number more than 300, and approximately \$170,000 of the \$250,000 needed to complete the appraisal on the basis originally planned has been underwritten. Lists of contributors were published in the January and February issues. Since then, subscriptions have been received from the following:

Mrs. William Amory, Boston, Massachusetts; W. DuBois Brookings, Wash.
(Turn to page 136)



Regional Consultants
Left—P. L. Buttrick, Northeastern
States
Right—Roy C. Brundage, Central
States
Above—C. R. Ross, Southeastern
States



TEACHING WOOD TO FIGHT

The U. S. Forest Products Laboratory is Proving an Effective Arsenal

By CHAPIN COLLINS

FOR more than two years, the United States has been hurling chunks of its woodnile at the Axis, just as fast as our woodsmen and mills could deliver the supply, well over 30 billion board feet of it a year.

A wooden club was one of man's earliest weapons, refined by the Irish into the shillalah and by the Australian bushmen into the boomerang. It has remained for several hundred American scientists and technicians, working in a \$1,500,000 laboratory far from actual battle fronts, to convert our woodpile into tools of war almost beyond imagination.

It is no exaggeration to say that ninety-nine percent of the work of the United States Forest Products Laboratory at Madison, Wisconsin, is now devoted to war. More than 650 persons are on its staff, compared with but 185 in 1941, and virtually all of them are busy searching for, investigating and testing ideas and methods to enable products of our forests to strike Ger-

many and Japan where it hurts the most.

Last year 6,000 representatives of industry and government went to the laboratory for answers to difficult technical questions. The requirements of the armed services and of other war agencies have been so heavy that the laboratory's annual budget of approximately \$1,000,000 a year has proved hopelessly inadequate. This has made it necessary for these agencies to make special allotments to enable the laboratory to perform vital war services.

The military has found the laboratory to be one of its most effective arsenals. Army Ordnance has been much concerned with the problem of crating, boxing and packaging war materials which must be delivered in perfect condition thousands of miles away, and under the most adverse circumstances. Shipping space has been at a premium, and timber supplies not unlimited. The laboratory set out to meet these problems in cooperation with other departments of the Army and Navy, Lend-Lease and the

War Food Administration.

To say the laboratory has been in the shipbuilding business is to stretch a point, but actually the first fifteen months of its research have been equivalent to the launching of many cargo vessels. Shipping space of 500,000 tons, worth at least \$50,000,000, has been saved. This is equal to one trip each for fifty 10,000-ton freighters.

To accomplish this, 1,200 packaging specifications were developed and nearly 6,000 packaging inspectors trained. It has been a gargantuan task. During 1943, crating and packaging requirements alone absorbed 15,000,000,000 board feet of lumber, forty-five percent of our total production. That is enough to build 1,500,000 houses, and more than half of it was for strictly military purposes.

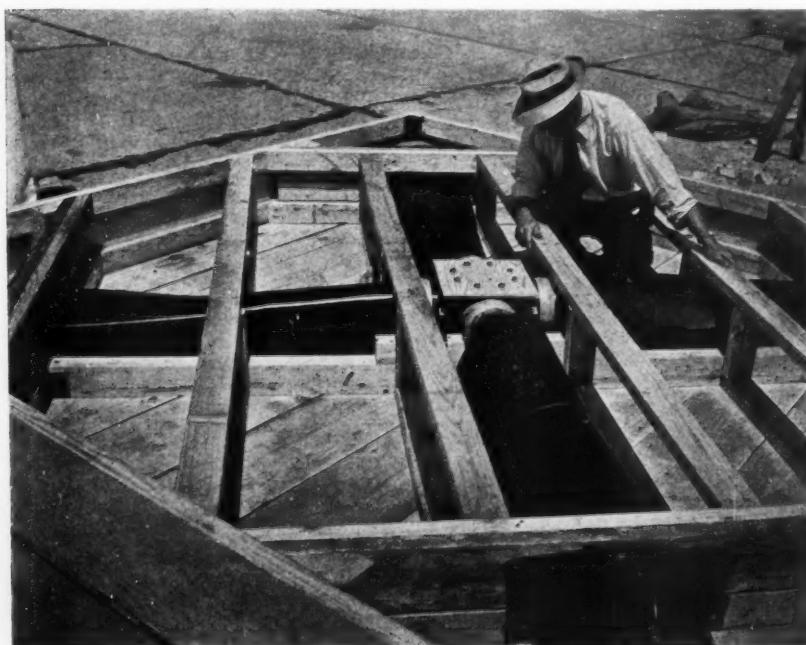
This achievement alone, in addition to contributing to victory, has saved the country more in dollars and cents than the entire cost of the laboratory's plant and the expense of running it for thirty years.

Wood today is perhaps our most critical raw material. Working at top peak and handicapped by manpower shortages, forest industries have not kept pace with increasing demand. Thus, any discovery that will enable a given amount of wood to do a bigger job is of vital concern.

The laboratory's research in the field of aviation has helped materially to stretch limited supplies of spruce and other woods suitable for aircraft. Both this country and Great Britain have expanded their use of wood, plywood and glues for planes and gliders. The plywood Mosquito, one of the fastest of bombers, is the modern counterpart of primitive man's wooden spear.

An unfortunate dearth of engineering data at first compelled aircraft designers to play safe by using more material, with consequent greater weight, to make certain their planes would be sufficiently strong. The laboratory tackled this problem, among many others, with the result that lighter, stronger and faster planes, using less material, are now in action.

One of the most interesting new products developed for planes is a laminated



Here is how laboratory engineers solved the problem of shipping a Flying Fortress propeller fully assembled and ready to mount

paper plastic. It has strength properties superior to those of any similar product, actually equal, weight for weight, to aluminum. At least thirty aircraft parts are now in full or experimental production.

Propellers for testing airplane motors are being made of a compregnated wood that had its inception in the test tubes and on the work benches at Madison. "Compregnated" is a coined word combining "compressed" and "impregnated." It refers to wood that is impregnated, under heat, with a plastic material and highly compressed at the same time. This product won't shrink, is highly durable, and can be molded—altogether ideal for the purpose. It is being tried now for flight propellers. Its use for aircraft carrier decking and other purposes is the subject of continued study and improvement.

How new uses of wood often have reactions in apparently unrelated fields is illustrated by the laboratory's studies of chemical utilization. Its research into the Scholler-Tornesch process for converting cellulose into glucose sugar may prove the means of saving many millions of bushels of vitally needed grain. This wood sugar, readily fermented into ethyl alcohol, is a prospective source of raw material for the synthetic rubber program and other war purposes. Germany has had more than twenty such wood-sugar plants, and others have been operated by Italy and Japan. Madison's technicians, using a small pilot plant at Marquette, Michigan, have improved the German process. It is now expected that the first large-scale plant will soon



An airplane propeller made of compregnated wood had its inception in the test tubes and on the work benches of the laboratory

be built in Oregon, near large sources of sawdust and other mill waste.

Following these findings, the Forest Service surveyed possibilities. It reports that alcohol production, using immediately available mill waste exclusively, can be boosted by 150,000,000 gallons annually, within less than a year, provided, of course, that the necessary plants can be erected. That, they say, is only the "cream of the crop," for it

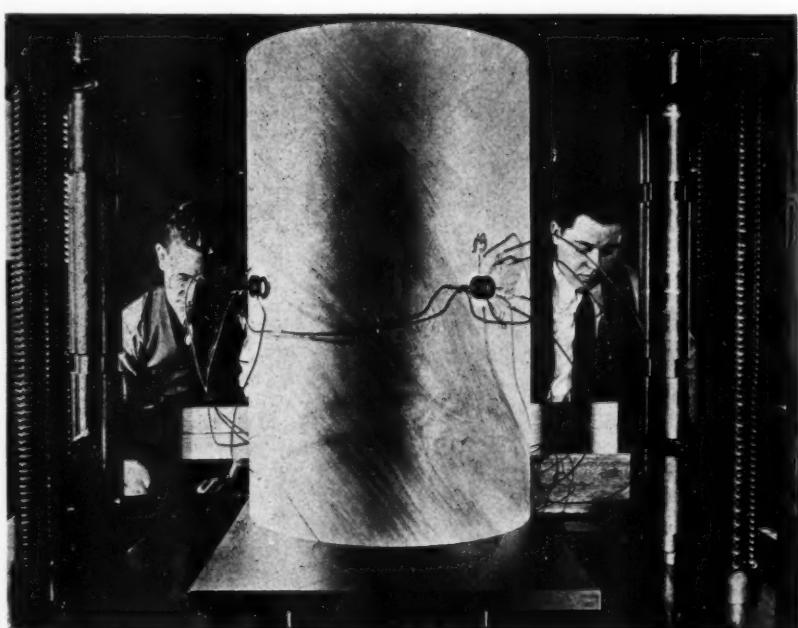
has been estimated that there is sufficient wood-waste in this country to produce more than 1,000,000,000 gallons of industrial alcohol every year.

The industrial alcohol program for 1944—largely for synthetic rubber—contemplated using some 170,000,000 bushels of grain, provided that we harvest enough for that and for food, too. One hundred and fifty million gallons from idle sawdust piles would relieve the pressure on dwindling grain stocks to the extent of 60,000,000 bushels of wheat or corn a year. The Department of Agriculture has reported that, by mid-summer, our grain reserves will be the lowest they have been in five years.

These are but a few of the laboratory's wartime accomplishments. Here are some others: Laminated wood for keels and ribs for ships, barges and landing craft; laminated hardwoods for transport truck bodies; methods of speeding seasoning of lumber, of great significance today when lumber is scarcely sawed from a newly cut tree before it is in use; improvement of fire-resistant treatment of wood; development of a wood-waste plastic that can be used for storage batteries instead of rubber; utilization of lignin, that chemically mysterious substance that forms approximately a third of wood.

Actual experimental work in the laboratory itself is only part of its job. Farmers want to know how best to harvest their woodlands. Manufacturers seek to learn how they can substitute wood for the metals they no longer can get. This involves choice of the proper

(Turn to page 136)



Determining the behavior of curved plywood under stress. Such tests are showing the way to better performance of military aircraft

A CITY PLANTS A FOREST

By CARROL C. HALL



Out of the poet's dream came a planted city lake—the Vachel Lindsay memorial bust and bridge

THE City of Springfield, Illinois, has planted a forest of more than a million trees and shrubs—and it hasn't cost the residents one cent in taxes. The planting has been done around Lake Springfield, the city's twelve-mile-long reservoir, and on 4,000 acres of marginal land dedicated to public use—for Lake Springfield is one of the few water supply reservoirs in the country where recreational activities of all kinds are permitted. This forestry undertaking dates back to 1930 when citizens of Springfield passed a bond issue of \$2,500,000 to provide a more adequate water supply. Lake Springfield, with a shore line of fifty-seven miles, resulted, the largest man-made lake in central Illinois.

Three years before the water rushed over the impounding dams in 1935, a nursery had been established and a program of tree planting and beautification initiated. This program, like the entire reservoir development, is financed by the sale of water to the

"Linger through the evening. Watch the sun go down in purple splendor, and study the famous afterglow of central Illinois, the benediction of the day. Watch the lights twinkle in the cabins between the fingers of the trees. An occasional laugh—a song comes to your ears. The glory of the moon and stars are caught in the net of the waves. Here is your interminable vacation trail and only four miles away from town."

—Vachel Lindsay.



Evergreen plantings guard the lake shore

community. The forty-acre nursery does no propagating, purchasing its trees and plants from state nurseries. The stock is varied. The 1941 plantings, for example, consisted of twenty-six varieties of trees and thirty-one different types of shrubs.

In the nursery certain trees are allowed to grow to one and a half inches in diameter and the shrubs to about three feet in height before they are transplanted to locations in the lake marginal area. Forest seedlings obtained from state sources are planted at their growing sites without an intermediate period at the nursery plot.

To carry on this program the city employs a year-round nursery crew and from time to time during the past decade has also used supplementary sources of labor. As many as a hundred men have been employed at one time.

Due to the extensive nature of these operations, the trees and shrubs are not watered after being transplanted. They

are, however, fertilized with compost developed at the nursery. Yet the nursery has a planting-survival record of over eighty percent.

The reforestation project is not without an experimental slant. In certain areas the city is trying to restore the primitive forest of native trees. In others beautification and shade are the objective. There is extensive use of evergreens as well as the hardiest shade and ornamental trees that have proven satisfactory for the region. In each group of plantings an attempt is made to have something in bloom throughout the growing season. More recently, there has been a serious attempt to extend the northernmost and the southernmost growth limits of certain trees. Unusual success has been experienced with the southern cypress and the northern larch.

Throughout the entire development the city has followed the principles and



Successive crops of trees and shrubs are grown in the city nursery



Tree planting crews work under supervision of trained foresters

practices of good forestry. Fire lanes are maintained and co-operation is given to all types of governmental insect and pest control.

A development of the extent and significance of that of Lake Springfield is not a spontaneous thing—it is a project resulting from long-range thinking and planning. Behind the whole program is the vision and work of one outstanding individual—Willis J. Spaulding, former commissioner of Public Property. Appointed in 1911, it was his persistence that brought the lake into existence.

As early as 1927, Mr. Spaulding was checking on possible lake sites, and, after the bond election, he supervised the construction of the lake. Under his direction the land was bought and cleared, roads were relocated and the dams constructed. In spite of this multitude of practical problems, his vision of the lake area as a place of beauty and recreation was never dimmed. Concrete evidence of his interest in esthetic possibilities has

been the employment of a landscape architect to supervise the development.

The reforestation program makes possible the use of the reservoir surroundings as a huge recreation area by the people of Springfield and neighboring communities. Boating, fishing, picnicking, swimming, camping, hiking, skating and other types of outdoor activities are enjoyed. There are five camps for boys and girls on the lake.

There are eight lake parks, seven devoted exclusively to picnicking. These parks cover about 250 acres and are provided with tables, fireplaces, wood to burn, toilet facilities and drinking water. As many as 40,000 people have enjoyed the parks during a single season.

One, the Abraham Lincoln Memorial
(Turn to page 138)



Fire lanes protect the new plantings, particularly from grass fires

Blue Ridge Mountain Mayhem

(From page 120)

ing Jew-Ann walked into the cabin of Milford Hight and shot him and his boy Homer while they were eatin' breakfast. He stood in the door and said, 'Stand up, Milford Hight, I aim to shoot you!' Milford stood up and Jew-Ann shot him. Homer ran for his gun an' he was shot, too.

"How come Jew-Ann to do it? Well, nobody knows. That's the way it was with most all these killins"—no witnesses, or the witnesses afeared to say anythin'. The bottom of the trouble was that Jew-Ann, livin' out in the woods, had been gettin' near Hight's still.

"Folks got all stirred up so the sheriff put on a real man-hunt. They say Jew-Ann went to Colorado. He lived there off an' on but finally came back to Georgia, hidin' out like he used to, with Marion helpin' him same as ever. 'Bout twelve years ago they finally caught Jew-Ann asleep in Marion's house. The witnesses for the Hight shootin' was all dead, but they give him four or five years on the gang for shootin' Hawk thirty-three years back. While Jew-Ann was servin' time, Marion was shot from the bushes near his house. His body lay in a creek a week a'fore anybody found him. Jew-Ann knowed the fellers who did it and he wrote me a letter sayin' he had found a 'lead mine' an' that he was goin' to show some samples of it when he got out. But he died sev'ral months 'fore his time was up."

We had been overlooking little hollows on the creeks that head the Toccoa River. Magnificent oak forests rolled down the mountains as though to engulf the islands of primitive cultivation. Ahead, the divide broke into a real wind gap, visible for miles as a passage through this mountain chain. It is called Hightower Gap. The drainage to the left is Hightower Creek, while to the right Rock Creek falls away among labyrinthine hollows and folds.

In Rock Creek, until very recently, lived the Boliles family with its five sons. Across the gap, Hen Black and his five sons and four daughters, with their families, constituted the sole population of Hightower Creek three years ago. Looking into the creek the eye falls on straggly clearings in the rolling mass of forest. Around these fields are the cabins of Hen Black and his children.

The ranger was talking about these families when we paused in the gap. "I was always expectin' Hen Black an' Harly Boliles to have a war. Each crowd had hawks rangin' wild on these creeks—an' hawks is always gettin' mixed up. Lot of our killin' was caused by one feller 'cusing somebody of stealin' his

hawks. It was always known that Hen and Harly carried guns for one another. Some say one of Hen's boys shot a lock of hair off' Harly. When you know how dangerous Harly Boliles was you got more respect for Hen Black, 'cause Hen lived right by him an' never backed off from him or anybody else.

"Fact is, Hen's a remarkable feller. Scared of nothin', an' nobody outhinks him. Had tough men 'round him all his life, but he never killed anybody an' he's still livin'. I'll tell you a story to show how Hen done things. 'Bout twelve years ago he an' one of his boys was comin' back from Dahlonega in an old Ford car. All of a sudden shots tore out of the bushes. It was a bushwhackin', but nobody got hit. Hen saw the two fellers who done it. 'Mortally to God, Bill, they're shootin' at us!' he roared. 'We'll go home an' git our shootin' irons.' They hurried back an' found the fellers, tied 'em up like hawks, threw 'em in their old Ford and hauled 'em to court at Dahlonega. Some folks 'round here think that sayin' 'hawk tied' got started from the way Hen tied up those fellers. Wish he an' his mule'd come along here so you could see him with his bushy mustache an' that old hat pulled down on his face. You could say you'd seen a mighty interestin' man."

We followed the road down into Rock Creek, where, as Woody put it, the Boliles used to keep things shot up. "The Boliles was a dangerous family to fool with," he went on, "and Wes Greenaway was one of the first to find it out. Wes and Harly was rangin' some cattle on the same land an' they got in an arg'ment. One day Wes came ridin' along this road goin' down tor'd Harly's place. The game warden, who lived in that old house over there, saw he had a gun an' wanted to take it away from him, 'cause guns aren't allowed in the preserve. But Wes begged to keep it, sayin' he expected trouble with Harly. Shore 'nuff, Harley was waitin'—an' killed him.

"In the woods a few steps from here there's a cabin that's rotted in now. Used to be where Moltey Hughes lived. He got mixed up the wrong way with Harly and two more men over makin' likker, an' a bunch came to get him. When Moltey come to the door one of 'em shot him an' then they ran up an' started beatin' him with their guns. Moltey's wife tried to stop 'em, an' got her arm broke. She was holdin' a baby an' it was knocked to the floor and killed. They had a trial over the Hughes killin', but his wife wouldn't testify an' Harly got off.

"Bout five years ago Harly got in an

arg'ment with his oldest boy, Carl, and Carl killed him on this road. They let him off on self-defense. The folks 'round here breathed a lot easier because of that shootin'. The next year, the third Boliles boy took the old car and got to scarin' people in the county seat with a pistol. The town policeman tried to arrest him an' Boliles plugged him dead. He was 'bout fifteen years old but he got life. The second Boliles boy got hold of the old car an' went over to Tennessee where he got on the chain gang for may-be resistin' arrest and some more things. After Harly got killed, and the boys in jail, his wife Dessie sold their little house place. You can see it over there through the trees. Folks didn't come 'round here much when Harly was alive an' I figger he done us some good keepin' poachers out of the deer preserve."

The ranger reflected a moment before going on. "I took a chance one time. Went over to put out a fire Harly an' a bunch had started while drinkin' an' cuttin' up. I stepped in an' cussed 'em out. They didn't make no fuss—just invited me to have a drink with 'em. That was a'fore I knowed much about Harly.

"You know, two of them Boliles boys weren't more'n nine or ten years old, an' they'd carry guns. 'Bout four years ago those little devils was ridin' along in their wagon an' CCC boys was workin' on the road. Just to tease them, one of the boys pitched some dirt in the wagon. 'Don't do that!' the oldest kid yelled. Some more dirt was thrown an' the ten-year-old jerked out a .45 and told them, 'Damn yu', I'll blow yu' brains out.' People didn't devil those kids—not if they knowed 'em."

Having descended the north side of the Blue Ridge we moved into gentle lands of the valleys farther down the Toccoa River, which, a few miles below, ends its swirling haste in a TVA reservoir. The ranger kept looking back and finally a green Forest Service pick-up truck swung into view.

"After all these killins' we been talkin' 'bout, did you think he was follerin' us for protection?" he chuckled. "That's my driver. When we get to the junction up here at the river, it's just a few miles for me to turn off to my house. After hearin' 'bout rough times in this country, guess you're wonderin' how things are now. Well, if he hadn't watched it himself, a feller'd never understand how things have changed in just ten years. Seems like a new generation has growed up, 'cause we have mighty little fightin' and killin' compared to what used to be. When you get good roads I s'pose moun-

(Turn to page 140)

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"When I was home," the Soldier went on, "I'd always go hunting with a couple of the fellows out to Harry Olsen's farm—swell hunting country. Pheasants, rabbits, partridge . . ."

"What's about that water?"

"Well, Harry has an old tin dipper hanging on the pump. And when we came back from hunting all morning, we'd head for that old dipper. And boy!—water out of that dipper always tasted better than anywhere else. I wish I was there right now!" . . . Remington's part in speeding peace is, of course, to continue to furnish Uncle Sam with military supplies. To give you some idea of what we have been doing . . .

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Remington
DU PONT

Michigan Votes to Acquire Porcupine Mountain Area

THE Michigan State Legislature has approved purchase by the state of 43,000 acres of the famous Porcupine Mountain area, the largest unbroken tract of virgin hardwood timber in the United States. This acquisition for which \$1,000,000 has been appropriated, will save from exploitation the most desirable section of the virgin area. It will be administered by the State Department of Conservation as a state recreational area.

At the same time, the legislature authorized \$4,000,000 for the acquisition of recreational lands within a radius of 100 miles of Detroit in southeast Michigan—\$1,500,000 to be available this year, the remainder to be spread over

a five-year period of development. The region involved is for the most part within a belt of high moraines.

The movement to save the Porcupine wilderness on the south shore of Lake Superior in the western end of the Upper Peninsula, dates back many years. Most recent effort was in 1941 when Representative Hook introduced in Congress a bill to enable the U. S. Forest Service to acquire portions of the area. This bill, which carried an appropriation of \$30,000,000, failed of passage. After that there was a movement to dedicate 46,000 acres of the region as a national park or monument. This is the area the state will now purchase.

Congress Approves New Forest Tax Legislation

INCLUSION of the so-called "Bailey Amendment" in the new Federal Revenue Bill, passed by Congress over the President's veto as this issue goes to press, is described by forest industry leaders as "the greatest impetus ever given to good forestry by federal action."

"The Bailey Amendment, by correcting serious inequities in federal tax laws as applied to the harvesting of timber, removes a factor which has tended to discourage long-range tree farming," commented David T. Mason, forest engineer of Portland, Oregon, who assisted the Forest Industries Committee on Timber Valuation and Taxation in seeking the amendment's adoption. "These inequities, in my opinion, have been for a number of years the greatest obstacle to private forestry."

Congress originally approved the bill early in February.

The new Revenue Bill provides for taxing the gain from the harvesting of timber upon a capital gains basis under which the maximum net rate is twenty-five per cent. In contrast, under the previous Revenue Acts, such timber gains have been taxed in the year of harvesting as ordinary income at rates which ran as high as ninety-three per cent in the case of individuals, and up to eighty-one per cent in the case of corporations, notwithstanding that such gains in growth or value of timber may have been accumulated over a long period of time.

Application of income tax rates to forest harvests was unfair and often destructive because it mistakenly assumed that the proceeds from such a harvest represented a single year's earnings instead of having been an accumulation over a considerable number of years.

The capital gains basis, however, is looked upon as a reasonable formula for counterbalancing the fact that timber values are not created in one year but in many.

Under the former Internal Revenue code, individuals or companies which sold their timber on the stump outright to others were permitted to figure the tax on their gain upon a capital gains basis, but prior to the new amendment, if the same individuals or companies cut their own timber and sold the products therefrom, or sold their timber on a cutting contract basis, retaining ownership of the land and of young timber not ready for harvesting, their gain on the timber itself was subjected to the high rates applicable to ordinary income.

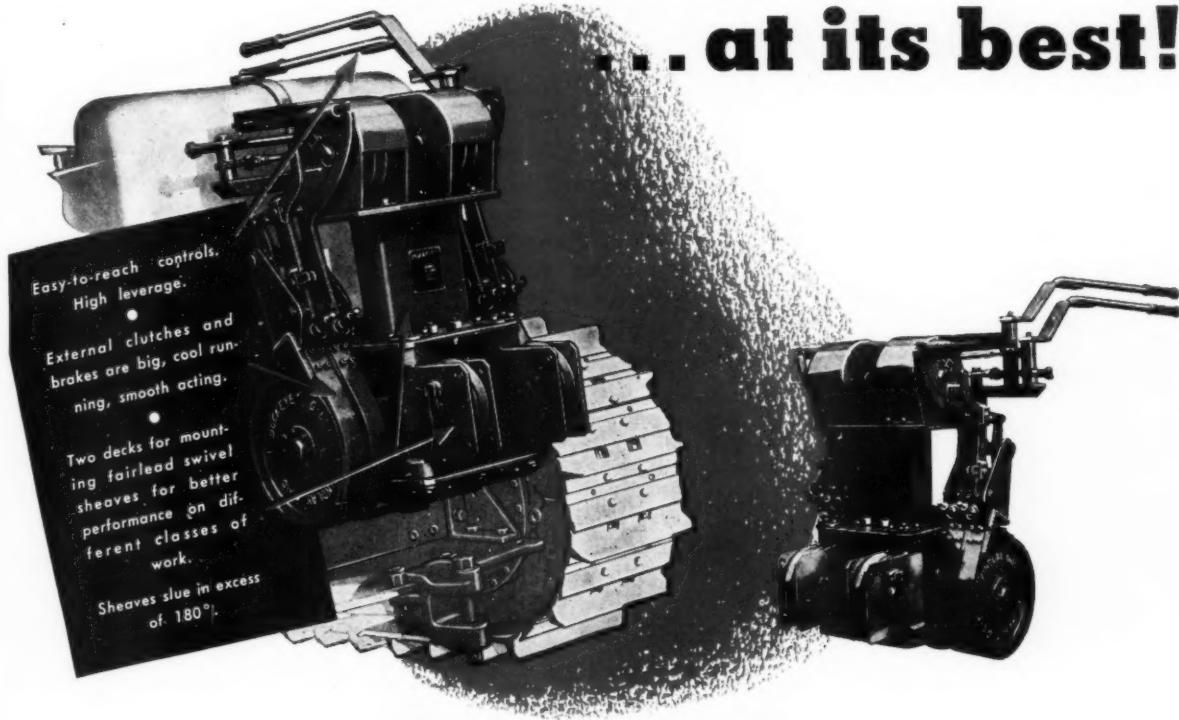
The new legislation, as described by Mr. Mason, "establishes wise public policy" which will strongly encourage the growing of trees.

"For the tree farmer," he said, "the time element is enormously important. From the seedling to the merchantable tree the time space may be as little as twenty-five years under favorable conditions, or more than 100 years. During this long growing period the tree grower is exposed to many hazards, both physical and economic—and exposed without any practicable form of insurance. Inequitable and very high income tax rates have recently been stripping most of his possible profits from the tree farmer; this has threatened to be a knock-out blow."

"The new legislation now removes this threat, and establishes a federal tax treatment which is definitely encouraging. This new, fair treatment will strongly stimulate tree farms and other forms of private forestry."

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PLOWMAN'S FOLLY, by Edward H. Faulkner. The University of Oklahoma Press, Norman, Oklahoma. 161 pages. Price \$2.00.

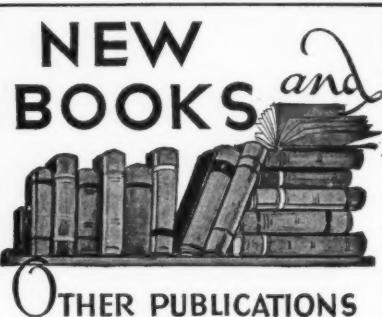
Once in a blue moon some one sees from a fresh point of view, ideas that have long been taken for granted. Such a person is Edward H. Faulkner, agriculturalist and business man, whose analysis of what happens to the soil when it is turned over for the moldboard plow and the surface organic matter buried too deep to be reached by plant roots, may revolutionize soil culture.

In *Plowman's Folly*, he gives an account of how he reached this revolutionary conclusion, and tells of his experiments with other methods of soil culture. He is an enthusiast and makes large claims which may be whittled down by the results of future work, but in any case, he has performed an extremely valuable service to agriculture by bringing up for thorough examination and study a technique called into being by conditions existing a century or more ago. It is to be hoped that Mr. Faulkner's book may have wide circulation among farmers, and that they will try out his methods of soil culture under a variety of conditions. It will be a great service to mankind if it can be proved that simpler and cheaper methods of soil culture than those now in use will yield better and larger crops.

Interestingly enough, Mr. Faulkner's conclusions were at first cold shouldered by government scientists who now give them a considerable measure of endorsement.

HOW TO LANDSCAPE YOUR GROUNDS, by Loyal R. Johnson. Published by A. T. De La Mare Company, Inc., New York, N. Y. 221 pages, illustrated. Price \$2.75.

The problem of landscaping home grounds for the purpose of combining beauty and utility is admirably treated in this book, which may be used as a manual for the economic planning of appropriate settings for dwellings. Detailed instructions and suggestions, as well as many helpful photographs and illustrations, are given on such subjects as flower and vegetable gardens, lawns, trees, shrubs, pergolas, walks, drives, pools, and many others. Lists of shrubs, acid soil plants, trees and vines compiled by Alfred C. Hottes, garden lecturer and author, which indicate the time of bloom for different localities, are included. Planting plans prepared by landscape architects which show garden and lawn arrangements suitable for all sections of the country make this guide extremely valuable for readers anywhere in the United States.



A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

KNOWING THE WEATHER, by T. Morris Longstreth. Published by the Macmillan Company, New York. 150 pages, illustrated. Price \$1.69.

This is a book for the aviator, the amateur weather forecaster, as well as the professional; and anyone who likes to talk about the weather. That covers a multitude. For weather has always been a subject of absorbing interest to many people. Mr. Longstreth's book deserves to become a best seller.

As we have grown increasingly air-minded, the weather has become of vital importance to us. We should also become air-wise. We need to know more about it than the bare facts in the newspaper. And one could not have a better introduction to new horizons such as the troposphere, air masses, cyclone and anticyclone, or the barometer, than in this fascinating book. Mr. Longstreth writes as a scientist, a poet, and a weather enthusiast, and he also sprinkles his text with such sparkling wit that the reader is entertained at the same time that he becomes a budding meteorologist.

There are twenty-three chapters covering such topics as clouds, winds, temperatures, rain and snow. They are likely to create an army of weather-lovers who will besiege the government for sheets of cloud forms and weather maps, and find themselves with a new hobby. They give you a new respect for the predictions of the Weather Bureau. Read Mr. Longstreth's book and then try forecasting yourself.

FOREST RESOURCES OF OREGON, by F. L. Moravets, N. S. Rogers, W. F. McCulloch, L. F. Cronemiller and Paul Dunn. Published by the State Board of Forestry at Salem and Oregon

State College, Corvallis, Oregon. 64 pages, illustrated. Free.

A compact, well written publication on the character, extent, volume of production, growth, and depletion of Oregon's forests. This—to some people dry information—is set forth with a graphic description of the forests and forest industries, and a discussion of state problems in developing sound forest policies and systems of management adapted to preserving a continuous flow of forest products. This is a highly important matter in a state where such products form the largest basic item of its income, and which produces more timber than any other state in the Union.

The authors represent the federal and state forest services and a state educational institution. Their cooperative endeavor is of a high order.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Preventing Destructive Fires in Southern Woodlands. Farmers' Bull No. 1926. For. Serv., U.S.D.A. Govt. Printing Office, Washington, D. C.

The South Carolina Pulp and Paper Industry—Report of the Investigating Committee. State Commission of Forestry, Calhoun Building, Columbia, S. C.

American Planning and Civic Annual—1942. Edited by Harlean James. American Planning and Civic Association, Union Trust Bldg., Wash., D. C. Price \$3.00.

Southern Pine Manual of Standard Wood Construction—14th edition. Southern Pine Association, Canal Bldg., New Orleans, La. Price \$1.00.

Florida Forest and Park Service—Seventh Biennial Report. Florida Board of Forestry and Parks, Tallahassee, Florida.

Range Conditions and Management of the Roosevelt Elk on the Olympic Peninsula, by John E. Schwartz, For. Serv., U.S.D.A., Wash., D. C.

Forest Statistics for Skagit County, Washington—Forest Survey Rep. 88, and **Forest Statistics for Whatcom County, Washington**—Forest Survey Rep. 89 (both from 1941 Revised Inventory), For. Serv., U.S.D.A., Pac-Northwest For. and Range Expt. Sta., Portland, Oregon.

The Forest Situation in Piedmont Virginia, by William A. Duerr, Thomas C. Evans and George E. Morrill. For. Survey Rel. No. 13. For. Serv., U.S.D.A. Appalachian For. Expt. Sta., Asheville, N. C.

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Hammerle Named Southern Pine Association Forester; Flory Becomes State Forester of South Carolina

WILLIAM C. HAMMERLE, for the past several years state forester of South Carolina, has been appointed forester for the Southern Pine Association, succeeding Brooks Toler, who resigned earlier in the year to become director of forestry for the Masonite Corporation at Laurel, Mississippi.

Charles H. Flory, forester for the Soil Conservation Service, and formerly as-

time to the technical phases of the Soil Conservation Service program.

His early experience was with the North Carolina Department of Conservation and Development as assistant state forester, and with the Pennsylvania Department of Forests and Waters as a district forester. He is a native of Pennsylvania and a graduate of the Pennsylvania State Forest School.

Mr. Toler, who will direct forestry activities on the lands of the Masonite Corporation, was formerly associated with The American Forestry Association in educational work in the South. Later he joined the Mississippi Forest Service and after that served the state as extension forester. In 1939 he was appointed state forester of Alabama, a position which he held until late in 1942 when he became forester for the Southern Pine



Charles H. Flory

sistant state forester of North Carolina, has succeeded Mr. Hammerle as state forester of South Carolina.

A native of New York, Mr. Hammerle has been associated with forestry in the South for the past eighteen years. Prior to his appointment in South Carolina, he was director of forestry for the State of Georgia. He previously had served with the U. S. Forest Service and had engaged in state forestry work in both North and South Carolina. He is a graduate of the New York College of Forestry at Syracuse.

Mr. Flory has been associated with the U. S. Soil Conservation service since 1934, first as a forester in charge of all forestry activities in North Carolina, then as assistant state coordinator, and until early in 1942 as assistant regional forester in charge of farm forestry activities in seven southeastern states. At that time he became acting chief forester in charge of the forestry program for the southeastern region. For the past year he has devoted most of his



W. C. Hammerle

Association. During his term in Alabama, Mr. Toler instituted numerous helpful innovations which increased the efficiency and development of Alabama's tree farm system. His Pine Association work expanded these efforts, promoting and developing tree farms in other southern states. Also he is credited with increasing the service and efficiency of the association's forestry work among lumber manufacturers and other timber owners in the southern states. Mr. Toler received his degree in forestry from Louisiana State University.

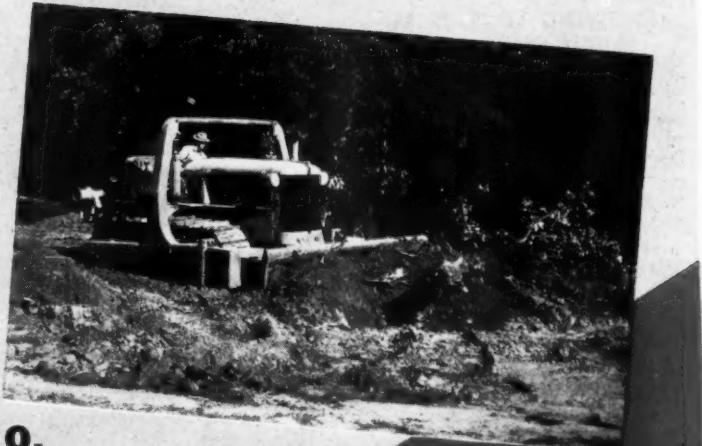


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CONSERVATION IN CONGRESS

ON February 7, three forestry bills—S. 45, to increase authorized appropriations for cooperative forest fire protection; S. 250 (H.R. 1621), to promote cooperative sustained yield forest management units; and H. R. 3848, to increase and extend authorization for the Forest Survey—were passed over without prejudice on the House Consent Calendar. S. 45 was objected to by Representative Robert W. Kean, of New Jersey, on the grounds that it authorized too much money to be considered on the Consent Calendar. S. 250 and H. R. 3848 were objected to by Representative Stephen Pace, of Georgia, because a subcommittee of the House Agricultural Committee, of which he is chairman, has decided to attach certain amendments to the bills prior to House passage.

Reason for this is that ninety-nine items contained in agricultural appropriations in past years have had no specific authorization from Congress. Thus Congress has been passing legislation in appropriation bills, which is considered bad parliamentary practice and is subject to a point of order. The Appropriations Committee refused to consider the unauthorized items—twenty-five forestry and seventy-four agricultural—in the Agricultural Appropriations bill this year. The Pace subcommittee will introduce a new bill containing authorization for the agriculture items and attach the forestry items to S. 45, S. 250, and H. R. 3848 as riders. How soon the subcommittee will act is not known.

Meanwhile, an effort is being made to obtain special rules from the House Rules Committee for each of the three bills. A full calendar in the House for the past several weeks has delayed this procedure. With the riders attached, it is doubtful if any of the bills could pass on the Consent Calendar.

Public hearings on H. R. 1688, by Representative Harris Ellsworth of Oregon, started on February 14 before the House Committee on the Public Lands. This legislation would transfer jurisdiction over some 462,000 acres of heavily timbered, unpatented Oregon and California railroad grant lands from the Department of Agriculture's Forest Service to the Department of the Interior's O. and C. Administration. When Congress, in 1916, vested in the federal govern-

ment the Oregon and California railroad and Coos Bay wagon road grant lands, certain odd-numbered sections in the "lieu" limits were unsurveyed and unpatented. Only patented lands in the grant are administered by the Department of the Interior under the Act and administration of the unpatented area is in dispute. (A bill, S. 275, introduced by Senator Charles L. McNary of Oregon, was amended by the Senate Public Lands Committee and passed by the Senate last July to continue administration of these lands in the Forest Service.) Meanwhile, in 1937, Congress provided for administration of the patented forest lands in this grant on a sustained yield management basis by the O. and C. Administration.

The House subcommittee on Agricultural Appropriations began executive hearings on the Agricultural Department items on February 7. They will probably continue through the month and into March. Members of this subcommittee include: Malcolm C. Tarver, Georgia, chairman; Clarence Cannon, Missouri, ex-officio; Harry R. Sheppard, California; Elmer H. Wene, New Jersey; William P. Lambertson, Kansas; Everett M. Dirksen, Illinois; and Charles A. Plumley, Vermont.

H. R. 4000, introduced by Representative Philip J. Philbin of Massachusetts, and Senate companion bill S. 1662, by Senator Ralph O. Brewster of Maine, provides deferment from selective service of loggers producing timber or pulpwood. Public hearings were held on H. R. 4000 before a House Military Affairs Subcommittee on February 11. Under Secretary of War Patterson, General Millard G. White and representatives of the War Manpower Commission opposed the bill. Representatives of the pulpwood, paper and lumber industries favored it. If enacted, this legislation would place loggers in the same classification as agricultural workers with respect to the draft.

Senator Hatch of New Mexico, recently introduced S. 1463, which would centralize record keeping and procedure for acquiring all federal lands in a single government department. This bill follows closely a recommendation of Senator Harry Flood Byrd's Special Committee on Reduction of Nonessential Federal expenditures.

CONSERVATION CALENDAR

Important Bills in Congress
With Action—January 25-
February 14, 1944

Appropriations

H. R. 4070—WOODRUM—Making appropriations for the Executive Office and sundry independent executive bureaus, boards, commissions and offices, for the fiscal year ending June 30, 1945. Passed House January 31, 1944. Referred to the Senate Committee on Appropriations February 1, 1944.

Forestry

S. 45—MCNARY—To further amend section 3 of the Clarke McNary Act, providing for forest perpetuation and extension, by increasing the annual authorization therefor and extending aid in combating tree insects and diseases. Passed Senate July 3, 1943. Reported with an amendment (No. 947) by the House Committee on Agriculture December 10, 1943. Brought up for consideration on the floor of the House but passed over without prejudice, February 7, 1944.

S. 250—MCNARY—To promote sustained-yield forest management. Passed Senate July 8, 1943. Reported with an amendment (No. 960) by the House Committee on Agriculture December 16, 1943. Brought up for consideration on the floor of the House but passed over without prejudice February 7, 1944.

Governmental Functions

H. Res. 346—ANDERSON—Providing for an investigation of the program for the planting of guayule to serve as a domestic source of crude rubber. Reported without amendment (No. 1113) by the House Committee on Rules February 10, 1944.

Public Domain

S. 275—MCNARY (H. R. 1688—Ellsworth)—Relating to the administrative jurisdiction of certain public lands in the State of Oregon. Passed Senate July 3, 1943. Public hearing held by the House Committee on Public Lands February 14, 1944.

Research

H. R. 3848—RANDOLPH—To amend section 9 of the act of May 22, 1928 authorizing and directing a national survey of forest resources. Reported without amendment (No. 966) by the House Committee on Agriculture December 17, 1943. Brought up for consideration on the floor of the House but passed over without prejudice February 7, 1944.



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Three Named to Appraisal Staff

(From page 121)

ington, D. C.; Bryce C. Browning, New Philadelphia, Ohio; Brown Company, Berlin, New Hampshire.

P. R. Camp, Franklin, Virginia; Camp Fire Club of America, New York City; Miss M. S. Campbell, Sewickley, Pennsylvania; Miss Lilian Cromelin, Washington, D. C.

Fernstrom Paper Mills, Pomona, California; Dr. Alexander Forbes, Milton, Massachusetts; Mrs. Waldo E. Forbes, Milton, Massachusetts.

James L. Goodwin, Hartford, Connecticut.

Hammond Bag and Paper Company, Wellsburg, West Virginia; Mrs. Monterey L. Holst, East Greenwich, Rhode Island; Dr. Charles E. Holzer, Gallipolis, Ohio.

C. D. Johnson Lumber Corporation, Portland, Oregon.

Masonite Corporation, Chicago, Illinois.

Neenah Paper Company, Neenah, Wisconsin; Northeastern Lumber Manufacturers Association, Inc., New York City.

Ohio Forestry Association, Wooster.

Roaring River Lumber Company, Portland, Oregon; W. S. Rosecrans, Los Angeles, California; Lt. Philip deN. Ruprecht, Detroit, Michigan.

Southern Hardwood Producers, Inc., Memphis, Tennessee; The Southern Lumberman, Nashville, Tennessee; Strathmore Paper Company, West Springfield, Massachusetts.

Irma Weill, Bakersfield, California; West Virginia Pulp and Paper Company, New York City; Laurance J. Webster, Holderness, New Hampshire; Willamette Valley Lumber Company, Portland, Oregon.

Teaching Wood to Fight

(From page 123)

species, correct grades, and, often, invention of a new process.

With all its war work, the laboratory keeps an eye on the objective for which it originally was established—to seek new and more efficient means of utilizing wood. There is little question but that wood is destined to play an increasingly important role in the nation's life, for of all our basic resources it almost alone can be replenished. While other resources may only be depleted, trees can be grown. In fact, many industrial operators now are deliberately growing trees for tomorrow's harvests. Since we must rely more and more upon wood, it behoves us to discover all there is to know about it—about specifications, designs, production processes, chemical, as well as mechanical, utilization.

The Forest Products Laboratory has studied such things since 1910. The first public institution of its kind in the world, it was established at Madison because it was convenient to large forest areas and because the University of Wisconsin provided a site and a building. This building served for twenty years, but in 1932 the laboratory moved into a new plant with which no forest products laboratory anywhere can compare. With later additions, it cost \$1,

500,000. It is a five-story structure, in modern style, occupying a ten-acre site overlooking the city and Lake Mendota. It provides 175,000 square feet of floor space.

Something of the nature of its normal activities can be gathered from its technical departments. Under the direction of Carlile P. Winslow, there are these divisions: wood preservation, timber mechanics, timber physics, industrial investigations, pulp and paper, derived products, and silvicultural relations. This last has to do with the relation of growth conditions to the properties of wood.

The laboratory's point of view is best expressed in its statement that "wise timber use is the best timber conservation." Thus, many of these new uses, particularly chemical developments, place no additional burden on our forests. Not more than about a third of the wood in a forest is suitable for lumber alone. With full utilization of the cellulose and lignin in boughs, branches, tree tops and in mill waste, it will be possible to more than double our actual consumption of wood without cutting a single additional tree. Perhaps more than any other single agency, the Forest Products Laboratory is seeking the way to this goal.

C. STOWELL SMITH, VETERAN FORESTER, DIES

C. Stowell Smith, forest products expert with the U. S. Forest Service, and for the past year consultant on lumber problems to the WPB, died on January 11. During his long service in forestry, which began in 1905, he also served with the National Lumber Manufacturers Association and the National Recovery Administration.

Rebuilding the Elm

(From page 107)

dred seeds were obtained from these efforts and only a fraction germinated. Of the hybrids obtained, two are particularly promising and have resisted serious injury from Dutch elm disease each year following three consecutive seasons of heavy inoculations. Both trees have coarsely hirsute, dark green, heavy leaves almost as large as those of the American elm. The crotches are largely acute-angled, and growth rate has been satisfactory. Obviously, the ultimate form of these trees or their usefulness in further breeding work cannot be predicted as yet.

Nine seedlings have also been obtained from approximately 500 rock-Siberian elm crosses. These as yet are too small for testing for resistance to disease.

Preliminary studies indicate that the sequence of development of the reproductive organs of each elm flower is such that the female part, the stigma, is receptive before the anthers shed pollen. This sequence suggests that crosses can be made without the tedious, flower-damaging technique of emasculation if the pollen from the tree selected as the male is applied at the proper time. This technique has been used extensively with good success for the past few years. A number of seedlings have been obtained showing characteristics intermediate between the parents or with definite characteristics of both parents.

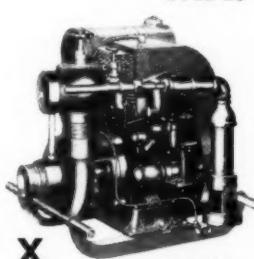
The fact that the stigmas of a flower become receptive before the anthers of the same flower shed pollen probably favors the appearance of elm hybrids under natural conditions where the flowering periods of two species overlap. In recent years, commercial nurserymen and others in the Great Plains area have reported that "chance hybrids" have appeared in elm blocks, and that the Siberian elm has hybridized naturally with the American elm and also with the slippery elm, *Ulmus fulva*, Michaux. The Division of Forest Pathology has assembled over 400 of such reported hybrids at Morristown. Some of these specimens definitely are hybrids, but a large number appear to represent selections rather than hybrids. Only a few trees of this lot have been tested for resistance to Dutch elm disease, but so far none appear promising. Many of the nurserymen state that their chief criterion for determining "chance hybrids" in blocks of elms is based almost entirely on vigor. Obviously, this is not entirely valid.

Because elms may hybridize naturally under favorable conditions, sites were found where elm seed could be collected from trees where natural hybridization

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might have occurred. Although this method permits no close control of the male parent, it may perhaps be the means of obtaining a large number of hybrids at minimum cost and effort.

In breeding or selecting resistant strains of trees, all faith should not be pinned to a single tree. The more numerous the resistant individuals, the better the chance of finding one among them that will grow in the various sites where elms are used today. In the Great Plains, the Siberian elm, despite its shortcomings, has been widely planted in shelterbelts and as a street and lawn tree because of its ability to withstand extremely dry weather. In many places it grows alongside some of our native species of elm, and often the branches of trees of the two species touch or inter-

lace and thus provide an excellent opportunity for natural hybridization. In the spring of 1942, interested persons in that region cooperated in locating elms in situations favoring natural hybridization, and in collecting seed from the trees. Several thousand seedlings are now on hand from these sources, but the seedlings are too young to determine how many are hybrids, and it will be several years before they will be large enough to test for resistance to disease.

The outlook for developing desirable elms resistant to Dutch elm disease and *Phloem necrosis*, and suitable for street, lawn, or park planting, or for shelterbelts and reforestation, appears promising. But assurance that the goals have been attained will come only after years of testing under natural conditions.

A City Plants a Forest

(From page 125)

Garden, was developed on a grand scale by the Garden Clubs of Illinois. Sixty acres in extent, it contains nature trails, rustic bridges and council rings.

One of the earlier developments was the Wildlife Sanctuary. Located in a less-frequented section of the lake area, it is a tract of 500 acres, a special project of the Springfield Nature League, which has been set aside for the encouragement of wildlife. It is crossed with nature trails and trees and shrubs have been planted to attract birds.

In fact, the entire lake area is a game preserve. Each fall and spring thousands of ducks and geese rest here.

Another beauty spot that is just getting under way is the seventy-acre Lake Arboretum, largest in down-state Illinois. The development of this project has been placed in the hands of a commission composed of well-known botanists and nature-lovers from all sections

of the state. It is to be a "museum of living plants."

The enumeration of all activities that are concerned with the Lake Springfield program is an impossible task. The city, for illustration, cares for forty-nine different roads and lanes varying in length from a few hundred feet to more than two miles. The planting necessary to protect embankments and cuts is a considerable task.

Establishing trees has its problems, too. Serious losses are sometimes experienced during droughts, wind and lightning storms. In addition to the vagaries of weather, insects damage the trees.

The reforestation of the Lake Springfield field area has not only provided the community with a beautiful recreational region but, in a sense, has caused that area to become a cultural center also. In July, 1935, the Lindsay bridge, a memorial to Vachel Lindsay, Springfield's world-famous poet, was dedicated. At the west end of the bridge now stands another Lindsay memorial—a bust in bronze done by the artist Adrien Voisin.

There is no question in the minds of literary Springfield that the poet Lindsay has had some influence on the Lake Springfield project. Mr. Spaulding often used quotations from the poet in his bulletins and department reports. The Lindsay Bridge, of concrete cantilever type, is one of two bridges crossing the lake.

The reforestation project and other developments at Lake Springfield are remarkable examples of good civic planning. Truly a unique combination of providing life's necessities with the recreational and esthetic aspects of human needs, it is a tremendous investment in human welfare.



Fire Prevention Where It Counts

(From page 117)

This means close cooperation between federal and state governments in the use of every method now known to reach and educate the public in the values of fire prevention. It means also that wherever these methods fail, strong laws and strict law enforcement must be applied.

But first, it would seem, we need a complete and scientific analysis of why local people, who should and usually do know better, are careless with fire. Particularly do we need to know why they set incendiary fires. This information is necessary for each forest region so that effective methods, designed to influence the most people, can be determined. Many different methods should be used, but these should be slanted to meet the particular prejudices and industries of each region.

Local prejudices form, without doubt, the major resistance to fire prevention. The local man feels that because he was born or has lived for many years in the forest, he is in a special class or position and has certain "rights" and "privileges." He assumes the attitude that he knows about such things as fire—so why listen to talk meant for "outsiders?"

How are fires started by the people who live and work in the forest? A study of this question should cover the whole range of their use of fire—and incendiary: smoking, brush and debris burning, burning buildings usually caused by faulty stoves or flues, campfires, warming fires, cattle branding fires, the use of logging or farm equipment without spark arrestors, hauling out hot ashes, smoking out bee trees, burning out rat nests, children playing with matches and the miscellaneous carelessness of the whole population.

To stop this waste of resources and the multiple ills inherent therein, what can we do? Here are a number of suggestions: Rural people, like their city cousins, go to the movies, so greater and more effective use of fire prevention movies can be made. This means good movies—movies which sugar coat the message with a layer of entertainment, not the type which tries to force a fire prevention or a conservation message upon the public. Such movies are likely to be made only by professionals.

More and better radio programs are desirable. Here is a way to bring an understanding of fire prevention and conservation to millions of people, rural and city alike. Programs should be entertaining or hold the listener's interest through excitement or drama. He must not be aware that he is being instructed.

Greater use of magazine and news-

paper articles is essential. These should be written to catch and hold the reader's interest—make him want to know more about forest fires, especially ways of preventing them. Magazine fiction with forest fire as the theme would influence millions of readers. But authors must have facts and authentic background. In this respect, it would be extremely worthwhile to set up an aid-to-writers service so that factual background material would be readily available.

There probably is no better method of fire prevention in the forest than personal contact. Woods workers, ranchers and farmers, unaccustomed to regimentation or group instruction, like to look at a man when he has something to say. Wherever man-caused fires are a major problem, it seems only common sense that good contact men should be on the job. They could keep fire prevention continuously before the people, learn all the kinks in local problems and design means to straighten them out.

To influence a greater number of local people the aid of all community leaders and organizations should be enlisted—key men, school teachers, ministers, postmasters, county supervisors, lodges, parent-teacher associations, stockmen's associations, labor unions, chambers of commerce, sportsmen's clubs, and so on. Most important of all, progressive programs should be developed in the schools and in Boy and Girl Scout and other youth organizations, for here are young minds open to enthusiasm and ideals. Particularly should every boy and girl living in or near a forest area be taught how to prevent fires—and why they should do so.

There are other problems which would require the special attention of experts on the ground. One is the re-examina-



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tion of what is now considered the necessary use of fire in the forest, cutting it to a minimum during fire seasons. There is, for instance, too much brush and debris burning in doubtful weather and under doubtful conditions. Much refuse could be disposed of without burning.

To expand fire prevention programs there should be more forest closures to keep people out of dangerous areas during hazardous periods. A closure not only eliminates certain fire risks, but it impresses people with the general danger of fire.

Greater effort also should be made to try incendiaries and other flagrant cases before federal courts instead of local courts—and to give convictions the widest possible publicity.

The use of open burners at sawmills should be discouraged. Community dumping grounds should be fireproofed if they are in hazardous areas. The problem of railroad fires started by sparks from locomotives, hot boxes and cigarettes thrown from train windows re-

quires more than caution on the part of railroad men and workmen. It is a case of rights-of-way free of growth and debris.

These suggestions and the new methods which will be found and adopted will require time, money and effort, but they are challenges which must be met. The cost would be unbelievable if we knew the value of the resources which have been burned and the fire-fighting costs of all man-caused fires for the past fifty years.

Fire prevention is the foremost safeguard of forests and related resources. A fire prevented is an untold amount of resources saved. So, in the final reckoning, it becomes of small importance to the future who is guilty of starting the nation's forest fires. The paramount fact is that we can and must fight most of our man-caused fires before they are started. The old slogan should be changed to read—"PREVENT FIRES, *Whatever the Cost, It Will Pay.*"

Blue Ridge Mountain Mayhem

(From page 126)

tains don't count like they once did—shuttin' people in an' shuttin' new things out.

"There are other things, too. Hundreds of men an' boys got work with the guv'ment. Schools been workin' on the young 'uns. Some folks's got radios. When you got jobs and recreation, the fightin' slacks off.

"We always had a lot of fine people back when this was hidden country. Do anything for a neighbor. Never complained, and there was hard times, too.

People thought life was mighty good—like a bird singin' on a May mornin'."

The ranger's pick-up rolled alongside at the junction. Bidding us goodbye he added, "Don't forget you ain't hardly seen any of this country—just a few pockets. Come back and we'll look over some more of it." Here, indeed, was a unique figure, compounded from the strong forces of a unique country.

How did the ranger manage to live for so many years with men who would unhesitatingly blast a disliked individual out of this mortal coil? In his own words, he "got along" with the reckless element. He did not interfere with their illicit whiskey making—an old formula for getting along in the mountains. To hold respect among such men, it is necessary to show mettle on occasion, and the ranger has shown plenty in the pinches. In a very few instances, he has even taken his own rifle down from over the fireplace.

Things still happen that remind one of the late departure of frontier ways. A few days before I left the ranger station word was brought in of a young man killed in a fight nearby. The game warden of the area along our route had just received a threat that he would be bumped off if he didn't watch out.

Our car rolled down the Toccoa River road toward the outland. The Blue Ridge and its companion highlands filled the view behind. How typical they are of the Southern Appalachian scene—

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beautifully wooded, gently contoured, veiled in a dreamy haze. So suggestive of peace they are, yet among the people living in such mountain areas has Anglo-Saxon blood coursed most hotly, flamed so often into impulses heedless of life and danger.

Judging from their behavior for the past 150 years, Southern Appalachian hill men have felt themselves members of a special warrior class. When war clouds have gathered around the American eagle, the mountains have poured forth their men to sustain the embattled republic. Start with the American Revolution. There were few settlers in and across the mountains then, and they had their hands full with the Indians. Nevertheless, when word was brought in that the British were within fifty miles of the Blue Ridge, mountain men gathered and filed eastward over wilderness trails to meet the nearest invading army. At King's Mountain they delivered one of the most skillful and decisive blows of the whole war. Thirty years later deerskin-clad mountaineers and bordermen composed the heart of Jackson's army at the Battle of New Orleans.

Because of their divided position during the Civil War, no clear-cut influence of the southern mountaineers is easily discerned. Possibly 160,000 of them are said to have fought for the Union.

From the first World War Sergeant York returned to his southern mountain home after capturing or killing around 150 Germans in one action.

Now wars have changed to mass mechanized movements, whereas the mountaineer's forte was more the hunter or individual tactics. His exploits are not so likely to stand out in the present war.

Though often involved in killings, the mountaineers were not anything like killers at heart. Despite their rude habits they felt a strong sense of duty, especially to live up to the principles of conduct most regarded in their society. Their hospitality and loyalty made a reputation; gold never meant as much to them as to others.

As the years go by none will remember, there will be no record, of the many thousands of individual family wars carried to death. Mouldering cabin chimneys overgrown in the forest, ancient gaps in the mountain walls where the wind sounds as always, forest paths of red man and white—these and all witnesses will be mute.

Time is fast catching up in the southern mountains. The people will be no different from rural people elsewhere. Maybe the nation will lose something in the way of its old shock-trooper for emergencies, the rough and ready highlander, case-hardened to danger and hardships through hazardous living at home.

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BALANCE SHEET AS OF DECEMBER 31, 1943

ASSETS	LIABILITIES AND SURPLUS
Cash	\$14,630.82
Accounts Receivable	2,473.98
Accrued Interest Receivable	1,230.75
Inventories	4,620.58
Deferred Charges	2,827.80
Forest Resource Appraisal	50,280.58
Endowment Fund (Including Real Estate)	282,745.76
Furniture and Equipment	1,602.78
TOTAL	\$360,413.05
	TOTAL
	\$360,413.05

INCOME AND EXPENSE ACCOUNT FOR YEAR ENDING DECEMBER 31, 1943

EXPENSE	INCOME
General Administration	\$29,169.32
AMERICAN FORESTS Magazine	33,880.31
Membership	15,383.75
Forester's Office	5,569.21
Educational Publicity	3,130.30
TOTAL	\$87,132.89
	TOTAL
	\$87,132.89

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Expenses	\$2.30	Receipts	\$171.92
Total Balance this Fund December 31, 1943			\$2,757.11

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Aging Trout

(From page 115)

One of Nature's strange paradoxes at Hot Creek is a fall-spawning variety of rainbow trout. All of the *Salmo* series of trouts, including the native rainbows of the Pacific Coast, progenitors of the famous rainbow clan now common in waters of both hemispheres, are natural spring spawners. Had they been used for propagation at Hot Creek the little fish would not have been available to anglers until more than a year after hatching. But the great, colorful brood fish at Hot Creek just put off their nuptial rites from three to five months later than their conventional cousins elsewhere, and their progeny, fat, gamy specimens, after their inch-a-month growth in the ponds, are ready for the anglers in nearby waters the following summer.

These brood fish came in part from a small state hatchery in southern California. The Utah State Hatchery also supplied a portion, and others were developed in Missouri by the U. S. Bureau of Fisheries. Some 2,600 of these splendid big females produced an estimated 4,500,000 eggs last autumn, and there is no logical reason why such a magnificent supply will not continue. Through the hatchery troughs, when the eggs are ready in autumn, flows a continuous supply of pure water at the ideal temperature of fifty-seven degrees, six degrees colder than the water proven best for the growing fish in outside rearing ponds.

How will an annual plant of over 1,000,000 "catchable" fish each year affect the countless lakes and hundreds of miles of beautiful streams of the Inyo-Mono region? Famous June Lake, probably best known and certainly one of the hardest-fished waters, received 100,000 trout in the month of June, 1942. The fish taken in July averaged eight inches in length. In the autumn months many fine ten-inch trout were taken. And some fourteen-inch specimens were a holdover from 1941 planting. An estimated fifteen percent of the heavy 1943 stocking was taken last year, so anglers may look forward to fine, brilliant rainbows of a pound and larger this coming season.

Similar results may be expected from the heavy annual planting in other waters of the region. Curtailed travel during the war will greatly lessen the former annual take of trout even though the region is readily accessible. Those vacationists, however, who can still find time for respite from war worries to return to the mighty Sierra, will find calm, peace and good fishing.

Nazi "Forestry"

(From page 112)

francs is promised for each cubic meter turned in. Upon those who do not furnish their quota, a fine is to be levied of 1,999 francs for each cubic meter lacking. For those who fall seriously under their quota, higher fines, prison or forced labor, or even severer punishment is threatened."

Luxembourg's forests, like the country, are small. Reports make it clear that the Nazis show "no respect for the finest beech and oak trees." Copse-wood and brushwood are also in abnormal demand, due to the lack of fuel. Judging from reports of wood fuel shortages in Denmark, her slender forest resource must also have suffered severely.

Information is scarce from the Balkans, but continued guerrilla fighting in the mountain forests of Yugoslavia indicates that whatever extensive plans the Germans and their erstwhile Italian allies may have made for forest exploitation have largely failed. However, the puppet government in the Croatian region established by German bayonets is reported permitting owners to dispose of only twenty-five percent of their output. A trade agreement between Croatia and Switzerland for the exchange of wood products for manufactured goods also points to the continuation of some sort of a forest industry in the region under actual German control.

Considering the poor state of the Greek forests, Germany probably would not have profited from them even if they had not been centers of continued patriot resistance. Hungary is poor in forests but has been able to export some hardwoods to Germany. Romania and Bulgaria are better forested, but except for a serious shortage of fuelwood, which may stem from labor and transport difficulties, little is known of the extent their forests have been affected.

Since the Baltic States are under the same general Nazi administration as occupied Russia, they may be considered along with that vast area. What the Nazis intended to do in the Russian forests was plenty, but Ministerial Director Barth, chief forester of the German "Occupied Eastern Area," said, according to *Affarsvalden*, last year: "It would be misleading to expect timber supplies from the East in the near future." Military events since that time have not altered this situation. Undoubtedly, the German army has used enormous quantities of Soviet wood for military purposes. The Russians also must have made extensive cuttings.

Finland and Sweden have lost practically all their export business, except with Germany. Apparently Finland's total cut has declined and Germany

has secured from her only about as much lumber and pulpwood as in recent pre-war years. Sweden, in the early war years, probably cut less than normal, although dearth of coal made it necessary for her to use large quantities of pulpwood for fuel. Her lumber cut between July 1942, and June 1943, however, was the greatest on record. It is not likely that the forests of either country have been seriously overcut.

In any wartime discussion of European forests, three critical questions must be asked even though they cannot be fully answered. First, has Germany succeeded in getting all the forest products she needed for war purposes? Second, to what extent has overcutting and general abuse reduced the European timber supply and the producing capacity of her forests? And third, will there be enough forest left to supply the needs for postwar reconstruction?

As to the first question, it is painfully obvious that the Nazis have secured enough forest products to keep their military machine and civilian economy going. And while they are probably not getting all the products needed, there is no evidence that shortages are sufficiently critical to cause a collapse irrespective of other shortages and military pressure. Germany, it must be remembered, has not added military requirements to normal civilian needs; she has reduced the latter to the barest subsistence minimum. It may be surmised that present civilian consumption is ten percent or less of normal. Even if it were several times this figure and timber harvests had been continued at the normal rate, Germany could have secured a very large amount of wood products for war purposes.

The extent of overcutting and cutting made regardless of the future of the forest doubtless varies with three factors: (1) Nazi plans for the future of the area; (2) transportation and labor conditions; and (3) local needs of the mili-

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tary machines for wood. In Germany, and in those regions annexed and incorporated within the Reich, overcutting in general was probably less and forest practices probably better than in areas she did not expect to turn into German territory. Where forests were easily accessible and labor conditions favorable, overcutting probably is the greatest. The intensity of population and the desires of the Nazis to reduce economic resources of individual countries also played its part. This probably explains the wiping out of historic French forests in the environs of Paris. In regions strictly under military control, cutting for purely military reasons seems to be entirely at the discretion of local commanders and to be made without the slightest regard for the future. This includes northern Norway, eastern Poland and Russia, and most of the "invasion coast" of France and the Lowlands.

The extra demand for wood fuel and charcoal for motor vehicle propulsion may well have caused cutting in younger age-classes which otherwise would not have been made. If so, this will have a serious effect twenty or thirty years from now, but it is not likely to materially affect immediate postwar problems.

It is frequently stated that Europe, unable to supply wood products needed for postwar reconstruction, must draw upon the forests of North America. No doubt the demand for transatlantic lumber will be greater than in the past, provided methods of financing a bankrupt continent are worked out, but it is well to keep in mind that Europe's forests, however badly overexploited, will not be completely exhausted. Russia, Finland, Sweden and possibly Yugoslavia and Czechoslovakia will still have exportable surpluses, although they may not be in a position to deliver their products immediately. As for the Germans, many are of the opinion that if they are such good foresters, they should exploit their own forests to rebuild their own bomb-shattered country.

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Plant Industry, U. S. Dept. Agr., Bureau of—pages 105, 106 and 107.

Ross, Charles R.—pages 118, 119 and 120.

Stanisots—pages 124 and 125.

Texas Forest Service—pages 108 and 109.

United Nations Information Office, New York, N. Y. Courtesy "Pour La Victoire"—page 110.

WHO'S WHO

Among the Authors in this Issue

SILAS J. SMUCKER (*Rebuilding the American Elm*)—Hoosier, was born on a farm near Goshen, Indiana, in 1904. Always interested in plant life and tree breeding, he studied at Goshen College and took his master's degree in plant pathology from Purdue in 1932. Since then he has been associated with the United States Bureau of Plant Industry, Soils and Agricultural Engineering, doing research work at the Field Laboratory at Morristown, N. J., on the Dutch elm disease and developing desirable types of disease-resistant elms.

CLAUDE KREIDER (*Aging Trout*) writes from California. Lover of the high places, he regularly pursues the trout hidden away in Sierra waters.

P. L. BUTTRICK (*Nazi "Forestry"*), well-known Yale forester, continues here the interesting account of forests under Hitler which he started in the December 1943 issue. Mr. Buttrick has recently been appointed a Regional Consultant of the Forest Resource Appraisal of the AFA.

W. E. WHITE (*Texas Sleet Storm*)—a Michigan Agricultural College man, who served with the Forestry Regiment—the famous "Tenth"—in World War I, has been connected with the Texas Forest Service since 1927—in 1942 succeeding to the position of State Forester.

JOHN CLARK HUNT (*Fire Prevention Where It Counts*)—knows his fire prevention. He is assigned to an administrative and public relations job at the Greenville Ranger Station, California.

CHARLES ROBERT ROSS (*Blue Ridge Mountain Mayhem*)—"born, bred and bruised" in western North Carolina, is deeply interested in the people of the Southern Appalachian mountains and their traditions. He is a Georgia forester, class of '31, and took his master's degree at the University of Washington.

CHAPIN COLLINS (*Teaching Wood to Fight*)—typical of the energetic West, was born in Seattle. He specialized in newspaper and publicity after his graduation from the University of Washington in 1921. Mr. Collins is publisher of the *Vidette*, at Montesano, Washington.

CARROLL HALL (*A City Plants A Forest*)—lifelong resident of Springfield, Abraham Lincoln's home town—teaches science at the highschool there. His avocation is free-lance writing of non-fiction material and his work appears in current civic and national publications.

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